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Citation for published version:

Remijsen, A, Miller-Naude, C & Gilley, L 2016, 'The morphology of Shilluk transitive verbs', *Journal of African Languages and Linguistics*, vol. 37, no. 2, pp. 201-245. <https://doi.org/10.1515/jall-2016-0010>

Digital Object Identifier (DOI):

[10.1515/jall-2016-0010](https://doi.org/10.1515/jall-2016-0010)

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Journal of African Languages and Linguistics

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The morphology of Shilluk transitive verbs

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1. Introduction

This paper presents a descriptive analysis of the morphology of transitive verb roots in Shilluk. Shilluk is a Luo language within West Nilotic, which is itself a subgroup within the Eastern Sudanic branch of the Nilo-Saharan language family (Lewis, Simons & Fennig 2015). The self-referent term for the Shilluk language is ḍóḱ cǎ́l(ɔ), or ‘dhøg Cøllø’ in the Shilluk orthography. It is spoken in South Sudan, in a region along the White Nile, near the town of Malakal.

A remarkable characteristic of Shilluk morphology is the central role of stem-internal exponence. That is, many inflections do not involve affixation, but are signaled instead through changes in tone, vowel length, Advanced Tongue Root (ATR) and vowel height, and the stem-final consonant. These stem-internal markers are illustrated in Table 1.

Table 1. Four forms drawn from the paradigms of two transitive verb roots.

	PAST	PAST 2SG	PAST ATP.DUR	PAST APPL
{lɛɛŋ} ‘throw’	á-lɛ́ɛŋ ⁱ	á-lèɛɛŋ ⁱⁱ	á-lèeen ⁱⁱⁱ	á-lēɛɛŋ ^{iv}
{kɔl} ‘take out’	á-kǎ́l ^v	á-kǎ́l ^{vi}	á-kùt ^{vii}	á-kǎ́l ^{viii}

ⁱ <<place here sound table1a.wav>>

ⁱⁱ <<place here sound table1b.wav>>

ⁱⁱⁱ <<place here sound table1c.wav>>

^{iv} <<place here sound table1d.wav>>

^v <<place here sound table1e.wav>>

^{vi} <<place here sound table1f.wav>>

^{vii} <<place here sound table1g.wav>>

^{viii} <<place here sound table1h.wav>>

Insight into these stem-internal changes – and especially tone, which has the highest functional load – is essential to the descriptive analysis of Shilluk grammar. This is particularly the case in relation to the transitive verb roots, the class of content words that presents the most extensive paradigms. In this context, we recognise the characterisation by Tucker, a specialist on Nilo-Saharan languages, of the linguistic analysis of the Shilluk verb as a “tantalizing experience” (Tucker 1955: 421). And yet, the morphological patterns of transitive verb roots are regular, that is, predictable within classes. This combination of complexity with regularity makes the transitive verbs the part of the grammar that is most conducive to develop insight into Shilluk morphology, just as is the case in related West Nilotic languages like Dinka (Andersen

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1993:1). These considerations motivate the current paper, in which we lay out the patterns of inflection of Shilluk transitive verb roots.

Our insights derive both from controlled elicitation and from corpus analysis. These data were collected on an annual basis, first in Khartoum between 1993 and 2002, and then in Khartoum and in South Sudan between 2008 and 2014. The main native-speaker language consultant is Otto Gwado Ayoker. He is from Tonga, at the southwestern edge of the Shilluk region. Evidence from his speech is in line with that of more than 20 other speakers from whom we have also collected data. Because the focus is on morphology, our examples are drawn primarily from elicited data rather than from spontaneously uttered texts. The latter are marked by [^], as in (1a)[^]. Sound examples are included in order to make the analysis more accountable and accessible, in particular given the difficulty to interpret transcriptions of tone patterns.

The paper is structured as follows. Sections 1.1 and 1.2 present background information on Shilluk syntax and on the Shilluk sound system, respectively. In Section 2, we present a classification of transitive verb roots into seven classes based on alternations of tone and vowel length in the stem syllable. Section 3 covers the morphological modification for deixis, both in relation to temporal structure (Sections 3.1, 3.2), and also in relation to spatial orientation (Section 3.3). Spatial deixis extends semantically into telicity (Section 3.3.2). Section 4 covers the valency-increasing operations: the applicative in Section 4.1, and the benefactive in Section 4.2. The valency-decreasing operations, in turn, are the focus of Section 5. Pronominal marking of the Subject(Agent) on the verb is described in Section 6. Section 7 covers a marked word order that sheds light on the historical development of Shilluk morphosyntax. The conclusions follow in Section 8.

1.1 Syntactic argument structure

The unmarked word order of a transitive clause in Shilluk is Object-Verb-Subject(Agent). This is illustrated by the examples in (1). The Subject(Agent)² constituent is preceded by the case-marking function morpheme *ì*; the Object constituent is unmarked. Of these two, the object constituent is obligatory, while the agent can be left out. When this happens, the identification of the agent is left to be resolved by the hearer on the basis of common understanding, or it may be vague.

- (1) a. [^] *cōoṭ-ē* / *kāa mòòk cǎm ì dēēŋ kì kàlⁱ*
end-3SG CONJ kind.of.fish³ eat ERG Deng PREP compound
'In the end, Deng ate the fish in his compound.'
- b. *kwān á-cǎm ì bǔulⁱⁱ*
porridge PAST-eat ERG Bol
'Bol ate porridge.'

ⁱ <<place here sound ex1a.wav>>

ⁱⁱ <<place here sound ex1b.wav>>

² The term Subject(Agent) corresponds to the notion of Agent in the sense of Dixon (1994).

³ Freshwater rattail, sc. *gymnarchus niloticus*.

In contrast with transitive verbs, which are bivalent, intransitive verbs are monovalent (cf. Nichols, Petersen & Barnes 2004). The structure of the latter is illustrated in (2). Here the Subject precedes the verb, and there is no case marker. On both counts, i.e., word order and case marking, the Subject of an intransitive verb is different from the Subject(Agent) of a transitive verb, and instead patterns along with the Object of a transitive clause. These considerations and related arguments support Miller & Gilley's (2001) hypothesis that Shilluk is an ergative language.

- (2) a. ⁱ **já á-búutⁱ**
 PRON1SG PAST-be.lying.down
 'I was down (with illness).'
- b. **twóɔŋ á-rìinjⁱⁱ**
 Twong PAST-jog
 'Twong jogged.'

ⁱ <<place here sound ex2a.wav>>

ⁱⁱ <<place here sound ex2b.wav>>

1.2 The Shilluk sound system

This section offers a brief summary of the Shilluk sound system, so as to enable the interpretation of the the phonemic transcriptions in the examples throughout this paper. Further details can be found in Gilley (1992); Remijsen, Ayoker & Mills (2011); Remijsen & Ayoker (2014); and Remijsen, Miller-Naudé & Gilley (2015).

Inflected Shilluk content words have at their core a monosyllabic stem that reflects the root. This root syllable is predominantly closed. The stem (inflected root) can combine with one prefix and with up to two suffixes.

Shilluk has 19 consonants. Voiceless stops, voiced stops, and nasals are phonemic at five places of articulation: bilabial /b, p, m/; dental /t̪, d̪, n̪/; alveolar /t, d, n/; palatal /c, ɟ, ɲ/; and velar /k, g, ŋ/. In addition there are the liquids /l, r/ and the semivowels /w, j/. There are no fricative phonemes. Consonant clusters within a syllable are limited to the onset of the stem syllable, where a semivowel – /w/ or /j/ – can follow another consonant. In the stem-final consonantal slot, the distinction between voiced and unvoiced plosives is not distinctive, and, furthermore, in this position there is a tendency for stops to weaken to continuants. We will represent stem-final plosives using the voiceless character.

There are ten vowels, divided into two sets according to the feature Advanced Tongue Root (ATR). They are shown in Table 2. The primary difference between pairs of [-ATR] and [+ATR] vowels – e.g. /ɪ/ vs. /i/ – is vowel height, as indicated by the transcriptions. In addition, each [+ATR] vowel is breathy relative to its [-ATR] counterpart.⁴

⁴ The role of voice quality as a secondary correlate of ATR is evidenced by measurements of energy distribution (Remijsen, Ayoker & Mills 2011).

Table 2. The Shilluk vowels phonemes

	Front		Central		Back	
	-ATR	+ATR	-ATR	+ATR	-ATR	+ATR
Closed	ɪ	i			ʊ	u
Half-open	ɛ	e			ɔ	o
Open			a	ʌ		

The monosyllabic content-word roots have either a short {CVC} or a long {CVVC} vowel underlyingly. In the surface phonology, however, there are three levels of vowel length: short /V/, long /VV/, and overlong /VVV/. They are illustrated in the minimal set **á-kǎl** ‘PAST-disturb:FUG.2SG’ vs. **ákǎl** ‘drumstick’ vs. **ákǎal** ‘drumstick:PL’. Syllables with an overlong vowel can be interpreted as morphologically complex.⁵ They reflect a root with either a short {CVC} or a long {CVVC} vowel. This will be made clear in Section 2.

Shilluk is a tone language, with a total of eight distinctive tone categories. All of these are found on the monosyllabic stem syllable of transitive verbs. This is illustrated in (3), on the basis of forms drawn from the paradigms of two verbs that are identical in segmental terms. There are three level tonemes – Low /c̀vc̣/, Mid /c̣vc̣/, and High /c̣vc̣/ – and five contours: Low Fall /c̣vc̣/, High Fall c̣vc̣/, High Fall to Mid /c̣vc̣/,⁶ Late Fall /c̣vc̣/, and Rise /c̣vc̣/.

- | | | | |
|-----|--|--|--|
| (3) | á-lèn̩ (Low) ⁱ
PAST-take:2SG
á-lên̩ (Low Fall) ^{iv}
PAST-drum:2SG

á-lě̃̃̃ (Rise) ^{vii}
PAST-take:APPL.2SG | á-lē̃̃̃ (Mid) ⁱⁱ
PAST-take:APPL
á-lě̃̃̃ (High Fall) ^v
PAST-drum

á-lě̃̃̃ (Late High Fall) ^{viii}
PAST-drum:FUG | á-lén̩ (High) ⁱⁱⁱ
PAST-drum:APPL.2SG
á-lě̃̃̃ (High Fall to Mid) ^{vi}
PAST-drum:APPL |
|-----|--|--|--|

i <<place here sound ex3a.wav>>

ii <<place here sound ex3b.wav>>

iii <<place here sound ex3c.wav>>

iv <<place here sound ex3d.wav>>

v <<place here sound ex3e.wav>>

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vi <<place here sound ex3f.wav>>
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vii <<place here sound ex3g.wav>>

viii <<place here sound ex3h.wav>>

The complete inventory of eight tone categories is contrastive in the stem syllable only: the tonal specification of affixes is restricted to Low, Mid, or High. However, clitics may give rise to apparent contour tones on sequences of function morphemes. For example,

⁵ For a more general discussion of this phenomenon in West Nilotic, see Andersen (1990).

⁶ This tone was first hypothesized in Reid (2009), based on the study of tone in Shilluk nouns. It was not included in Remijsen, Ayoker & Mills (2011), which was based primarily on the study of verbs. Reid's hypothesis has since been supported by evidence from the verb system (Remijsen & Ayoker 2014), in particular in the applicative of Low Fall verbs – cf. (3) and Table 9 below.

when the habitual marker **ɲí** combines with the imperfective inflection of a transitive verb, a contour tone results, as in (4). Here **ɲí** coalesces with the verb prefix to give rise to a long vowel with a high falling contour tone in a phonetic sense: [ɲííṁâaɬɔ̃]. Further details on the Shilluk tone system can be found in Remijsen & Ayoker (2014).

- (4) **câak ɲí ù-mâaɬ-ɔ̃ⁱ**
 milk HABIT IMPF-drink
 ‘Somebody always drinks milk.’

ⁱ <<place here sound ex4.wav>>

2. Classes of transitive verbs

In this section we explain how seven classes can be distinguished among the transitive verbs, based on alternations in terms of vowel length and tone. Inflections diverge from one another in the extent to which the difference between these classes is revealed: there is no inflection in which all seven of the classes are different. Equally, there is no inflection in which all of the differences between verb classes in terms of tone and vowel length are neutralized. The inflections brought up to illustrate the transitive verb classes in this section will be discussed at length further along in the paper.

A first dimension on which the verb classes diverge is vowel length in the stem syllable. In the basic past tense, some verbs have a short stem vowel (V), whereas others have a long one (VV). This is illustrated in (5): {ɲɔɭ} ‘cut’ and {cam} ‘eat’ have a short stem vowel, whereas {lɛɛɲ} has a long stem vowel. The length of the vowel in the basic past tense can be interpreted as the lexical length of the root vowel, which can be short or long.

- (5) a. **jāaɬ á-ɲɔ̃ⁱ** b. **kwān á-cāmⁱⁱ** c. **lwɔ̃ɔɭ á-lɛ́ɛɲⁱⁱⁱ**
 tree PAST-cut porridge PAST-eat calabash PAST-throw
 ‘Smb. cut the tree.’ ‘Smb. ate the porridge.’ ‘Smb. threw the calabash.’

ⁱ <<place here sound ex5a.wav>>

ⁱⁱ <<place here sound ex5b.wav>>

ⁱⁱⁱ <<place here sound ex5c.wav>>

However, many verbs are also found with greater vowel length in other inflections. One of these inflections is the past tense 2nd singular. Illustration (6) shows this form for each of the three verbs in (5). Note that both {cam} ‘eat’ and {lɛɛɲ} ‘throw’ display increased vowel length in the past tense 2nd singular, where they have an overlong vowel, relative to their basic past tense form. This form with greater vowel length can be interpreted as the morphological long grade of the stem.

- (6) a. **jāaɬ á-ɲɔ̃ⁱ** b. **kwān á-càaamⁱⁱ** c. **lwôol á-lèɛɛɲⁱⁱⁱ**
 tree PAST-cut:2SG porridge PAST-eat:2SG calabash PAST-throw:2SG
 ‘You cut the tree.’ ‘You ate the porridge.’ ‘You threw the calabash.’

ⁱ <<place here sound ex6a.wav>>

ⁱⁱ <<place here sound ex6b.wav>>

ⁱⁱⁱ <<place here sound ex6c.wav>>

We can now distinguish three patterns in terms of lexical and morphological vowel length. First there are the ‘Fixed Short’ verbs, which have a short vowel throughout their paradigm, illustrated by the forms of {ɲɔɭ} ‘cut’ in (5a) and (6a). Second, there are the ‘Long’ verbs, such as {læŋ} in (5c, 6c). They have a long root vowel (VV) in their basic past tense form, and they lengthen to overlong in some inflections, such as the past tense 2nd singular. Third, there are verbs like {cam} ‘eat’, which are lexically short, as seen from (5b), but which become overlong in the past tense 2nd singular, as seen from (6b). We will refer to this pattern as ‘Short with Grade’. Short with Grade verbs are indistinguishable from Fixed Short verbs in some inflections – such as the basic past tense – and indistinguishable from Long verbs in others – such as the past tense 2nd singular. In summary, there are three patterns of alternation among transitive verbs in terms of vowel length: Fixed Short, Short with Grade, and Long. In order to determine to which of the three groups a verb belongs, it is necessary to examine both an inflection that displays the short grade, and also one that potentially displays the long grade.

The other dimension on which the transitive verbs separate into classes is tone. In some inflections the verb classes are indistinguishable for tone. The basic past tense is one of these. As illustrated in (5), all transitive verbs have the High Fall – transcribed \hat{v} – on the stem syllable in this inflection. Other inflections display a divergence in the classes with respect to tone. One of these is again the past tense 2nd singular. In the instances of this inflection in (6), all three of the verbs have the Low toneme on the stem syllable. But this is not the case for all transitive verbs, as illustrated in (7). The verbs {kɔɭ} ‘disturb’ and {kɔɭ} ‘take out’ are both Fixed Short verbs. As seen from (7a,b), they are indistinguishable from one another in the basic past tense. The past tense 2nd singular reveals a difference: here {kɔɭ} ‘disturb’ has the Low toneme, whereas {kɔɭ} ‘take out’ has the Low Fall.

- | | |
|--|--|
| <p>(7) a. bʊʊl á-kɔɭⁱ
 Bol PAST-disturb
 ‘Somebody disturbed Bol.’</p> <p>c. bʊʊl á-kɔɭⁱⁱⁱ
 Bol PAST-disturb:2SG
 ‘You disturbed Bol.’</p> | <p>b. kʊʊʊt̃-ʊ á-kɔɭⁱⁱ
 thorn-SG PAST-take.out
 ‘Somebody took out the thorn.’</p> <p>d. kʊʊʊt̃-ʊ á-kɔɭ^{iv}
 thorn:SG PAST-take.out:2SG
 ‘You took out the thorn.’</p> |
|--|--|

ⁱ <<place here sound ex7a.wav>>

ⁱⁱ <<place here sound ex7b.wav>>

ⁱⁱⁱ <<place here sound ex7c.wav>>

^{iv} <<place here sound ex7d.wav>>

This tonal distinction is crossed orthogonally with the length-based class distinction. That is, Fixed Short, Short with Grade, and Long verbs can all have either the Low or the Low Fall in the 2nd singular past tense, yielding a total of six classes in terms of vowel length and tone. These are displayed in Table 3. Based on their behavior in inflections such as the past tense 2nd singular and the imperfective, we can categorize verbs as Low or Low Fall verbs. This distinction between the Low and the Low Fall verb classes is manifested through other tonal specifications as well. For example, the past tense applicative of the the Low verb {kɔɭ} ‘disturb’, introduced in (7), is **á-kɔɭ** ‘PAST-

disturb:APPL', with the Mid tone, while the past tense applicative of {kɔl} 'take out', also in (7), is **á-kɔl** 'PAST-take.out:APPL', with the High Fall to Mid. In general, whenever the Low and Low Fall classes diverge in terms of tonal specification, the Low Fall verbs have a tonal specification that involves higher fundamental frequency (f0) than the Low verbs.

Table 3. Illustrations of the seven transitive verbs classes, in four inflections that reveal the differences between them in terms of vowel length and tone.

Verb classes	Fixed Short		Short with Grade		Long		
	Low	Low Fall	Low	Low Fall	Low	Low Fall	High Fall
Example	{ɲɔl}	{lɛɲ}	{cam} 'eat'	{mal}	{lɛɛɲ}	{maat}	{mɔɔt}
	'cut'	'drum'		'roast'	'throw'	'drink'	'greet'
PAST	á-ɲɔl	á-lɛɲ	á-cám	á-mál	á-lɛɛɲ	á-máat	á-mɔɔt
PAST 2SG	á-ɲɔl	á-lɛɲ	á-càaam	á-mállal	á-lɛɛɛɲ	á-máaat	á-mɔɔɔt
IMPF	ù-ɲɔl-ɔ	ù-lɛɲ-ɔ	ù-càaam-ɔ	ù-mállal-ɔ	ù-lɛɛɛɲ-ɔ	ù-máaat-ɔ	ù-mɔɔɔt-ɔ
PAST FUG	á-ɲɔl	á-lɛɲ	á-cáaam	á-mállal	á-lɛɛɛɲ	á-máaat	á-mɔɔɔt

Finally, there is a seventh class, the Long / High Fall verbs. Its members pattern along with the Long / Low verbs in many inflections. Note in Table 3 how the past tense 2nd singular of the Long / High Fall verb {mɔɔt} has the Low tone on the stem syllable, just as the Long / Low verb {lɛɛɲ} does. However, the Long / High Fall class diverges from the Long / Low class – and from all other classes – in terms of the tonal specification in inflections such as the imperfective and the past tense inflected for spatial deixis (centrifugal). The tonal specification of the Long / High Fall class is illustrated further in (8), using the minimal set of the Long / High Fall verb {lɔɔɲ} 'take turns' (8a,c,e) and the Long / Low Fall verb {lɔɔɲ} 'pluck' (8b,d,f). The verb {lɔɔɲ} 'take turns' could be mistaken for a Low verb based on its the 2nd singular past tense form (8a). However, the forms in (8c,e) reveal that it is a member of the Long / High Fall class. The imperfective is an inflection in which all seven of classes reveal their class-specific tone: Low, Low Fall, or High Fall. The past tense spatial deixis (centrifugal) is an inflection where only the Long / High Fall verbs have the Low Fall, while the six other classes all have the Late Fall.

- | | |
|--|--|
| <p>(8) a. t̪āal á-lɔɔɲⁱ
 cooking PAST-take.turns:2SG
 'You took turns cooking.'</p> <p>c. t̪āal ù-lɔɔɲ-ɔⁱⁱⁱ
 cooking IMPF-take.turns-IMPF
 'Somebody is taking turns cooking.'</p> <p>e. t̪āal á-lɔɔɲ^v
 cooking PAST-take.turns:FUG
 'Somebody went away to take turns cooking.'</p> | <p>b. gɲɛɛɛn-ɔ á-lɔɔɲⁱⁱ
 chicken:SG PAST-pluck:2SG
 'You plucked the chicken.'</p> <p>d. gɲɛɛɛn-ɔ ù-lɔɔɲ-ɔ^{iv}
 chicken:SG IMPF-pluck-IMPF
 'Somebody is plucking the chicken.'</p> <p>f. gɲɛɛɛn-ɔ á-lɔɔɲ^{vi}
 chicken:SG PAST-pluck:FUG
 'Somebody went away to pluck a chicken.'</p> |
|--|--|

ⁱ <<place here sound ex8a.wav>>

ii <<place here sound ex8b.wav>>

iii <<place here sound ex8c.wav>>

iv <<place here sound ex8d.wav>>

v <<place here sound ex8e.wav>>

vi <<place here sound ex8f.wav>>

The above examples show that, in the morphophonology of transitive verbs, verb classes do not have a monopoly on particular tone categories. For example, while a Low Fall toneme is found in the past tense 2nd singular of Low Fall verbs, as in (8b), it also appears in the past tense centrifugal of High Fall verbs, as in (8e).

The distinction between the three tone-based classes can be corroborated on the basis of the small-clause infinitive form, that is, the form used when the verb takes an internal argument, while it is itself an internal argument of the verb that heads the clause. This form is illustrated in the examples in (9).⁷ As seen from the examples in (9), the infinitive displays the short grade of the stem. Importantly, the tonal specification of the stem syllable reflects the tone-based distinction between verb classes: Low for the Low verbs {ɲɔl} (9a) and {cam} (9b), Low Fall for the Low Fall verb {maat} ‘drink’ (9c), and High Fall for the High Fall verb {mɔɔt} ‘greet’ (9d).

- | | |
|---|---|
| (9) a. bǔul dwàatf-á ɲòl-ì jāatⁱ
Bol want-FOC ⁸ cut-SG tree
‘Bol wants to cut the tree.’ | b. bǔul dwàatf-á cà-m-ì kwānⁱⁱ
Bol want-FOC eat-SG porridge
‘Bol wants to eat porridge.’ |
| c. bǔul dwàatf-á mâatf-í càakⁱⁱⁱ
Bol want-FOC drink-PL milk
‘Bol wants to drink milk.’ | d. bǔul dwàatf-á mɔɔt-ì jǎak-5^{iv}
Bol want-FOC greet-SG chief:SG
‘Bol wants to greet the chief.’ |

i <<place here sound ex9a.wav>>

ii <<place here sound ex9b.wav>>

iii <<place here sound ex9c.wav>>

iv <<place here sound ex9d.wav>>

A classification of over one hundred transitive verbs in terms of the seven verb classes is provided in the Appendix. There is no clear semantic basis for the division into these classes, beyond a tendency for verbs that typically take a human as internal argument to belong to the Long / High Fall class. We underline that this is merely a tendency. The correlation between verb class membership and vowel quality is stronger. The Fixed Short verbs mostly have a closed or a half-open root vowel, and the Short with Grade verbs mostly have an open root vowel.

⁷ The small-clause infinitive form takes a suffix that agrees for number with its object: the suffix is Low-toned when the object is singular, as in (9a,b,d), and High-toned when the object is plural, as in (9c). Nouns referring to liquids, such as milk in (9c), are grammatically plural in Nilotic languages (cf. Zwarts 2007).

⁸ The verb form /dwàatf-á/ is realised [dwàadáa]. The underlying verb-final /ɪ/ cannot be observed. It can be inferred on the basis of the future tense, for which there is both /ú-dwàatf/ and /ú-dwàatf-á/ [údwàadáa]. In the imperfective, the form without the suffix /-á/ is not available.

3. Deixis

3.1 Temporal deixis and evidentiality

Miller & Gilley (2007) distinguish four patterns of tense-aspect-modality (TAM) that are morphologically marked on transitive verbs: (1) past, which implies eyewitness evidentiality; (2) perfective, which implies inferential evidentiality; (3) imperfective, which may be used with past, present, or future time reference, but is typically used for present or near future; and (4) future. All four of these TAM inflections involve prefixation. In this section, we lay out the patterns of morphological exponence of each of these four inflections, for each of the seven verb classes distinguished in Section 2. Table 4 presents an overview. The past-tense form of the verb involves the prefix /á-/ , and the High Fall on the stem syllable. This is the case across the seven verb classes, i.e., there is no class-specific marking of tone in the basic past tense. If the verb is a member of a class that varies in vowel length in its paradigm, then the past tense is in the short grade. The future tense form is identical to the past tense form, except for the prefix, which is /ú-/ in the future tense.

Table 4. The four TAM inflections, illustrated for each of the seven verb classes. The classes are represented by {ɲɔɭ} ‘cut’, {lɛɲ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɛɲ} ‘throw’, {maat} ‘drink’, {mʌʌt} ‘greet’.

	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲʃɭ	ú-ɲɔɭ-ɔ	ù-ɲɔɭ-ɔ	ú-ɲʃɭ
Fixed Short / Low Fall	á-lɛ́ɲ	ú-lɛ́ɲ-ɔ	ù-lɛ́ɲ-ɔ	ú-lɛ́ɲ
Short w. Grade / Low	á-cám	ú-càaam-ɔ	ù-càaam-ɔ	ú-cám
Short w. Grade / Low Fall	á-mʌ́ɭ	ú-mʌʌɭ-ɔ	ù-mʌʌɭ-ɔ	ú-mʌ́ɭ
Long / Low	á-lɛ́ɛɲ	ú-lɛ́ɛɛɲ-ɔ	ù-lɛ́ɛɛɲ-ɔ	ú-lɛ́ɛɲ
Long / Low Fall	á-mʌ́aɬ	ú-mʌaɬ-ɔ	ù-mʌaɬ-ɔ	ú-mʌ́aɬ
Long / High Fall	á-mʌ́ʌɬ	ú-mʌ́ʌɬ-ɔ	ù-mʌ́ʌɬ-ɔ	ú-mʌ́ʌɬ

The form of the perfective involves the prefix /ú-/ and the suffix /-ɔ/.⁹ If the verb belongs to a class that lengthens morphologically, then the stem syllable is in the long grade. For example, {cam} ‘eat’ has the past tense form á-cám, but ù-càaam-ɔ in the perfective. The toneme on the stem syllable reveals the tonal class of the root: Low, Low Fall, and High Fall. The suffix carries a Mid in the case of the High Fall verbs, and Low for the other six classes. Finally, the imperfective form is identical to the perfective but for the tonal specification on the prefix /u-/, which is Low, not High.

It is not the case that verbs are invariably marked for one of the four TAM forms. There are two contexts in which we have found a main-clause verb to appear without TAM

⁹ The suffix /-ɔ/ is weakly realised, both in this inflection and in other inflections in which it is involved. Utterance medially, it elides before another vowel. Utterance-finally, it is typically voiceless, and it is reduced to the extent that its realisation is often limited to an aspirated release following the stem-final consonant.

marking. The first of these is illustrated in (10). (10a) shows the form of {ɲɔɭ} ‘cut’ inflected for imperfective. The unaffixed form of the verb is ungrammatical in (10b), but is grammatical when if the clause includes the focus marker /-à/. This is illustrated in (10c), where the focus is marked on the internal argument, and in (10d), where focus is marked on the prepositional phrase. In the latter example, the preposition /kí/ and the focus marker /-à/ coalesce into [káà]. Andersen (1988) discusses a similar interaction between focus and TAM marking in Pări, a closely related language. For example, he states “káà [that is, the preposition /kí/ combined with the focus marker /-à/] cannot cooccur with a completive verb form.” (Andersen 1988:313).

- (10) a. **jāat̚ ù-ɲɔɭ-ə̃ⁱ**
tree IMPF-cut
‘Somebody is cutting wood.’
- b. ***jāat̚ ɲɔɭ**
tree cut
‘Somebody is cutting wood.’
- c. **jāat̚-à ɲɔɭⁱⁱ**
tree-FOC cut
‘Somebody cuts specifically wood.’
- d. **jāat̚ ɲɔɭ kí-à góocīⁱⁱⁱ**
tree cut PREP:FOC hit-INSTR.NOM
‘Somebody cuts wood specifically with a machete.’

ⁱ <<place here sound ex10a.wav>>

ⁱⁱ <<place here sound ex10c.wav>>

ⁱⁱⁱ <<place here sound ex10d.wav>>

The second context in which a main-clause verb is not marked for TAM is illustrated in (11). The absence of TAM marking on **jwāaat-é** is correlated with the fact that, through the use of the conjunction **kāa**, the second clause refers to an event that takes place in sequence to the event referred to in the first clause. This is common in narratives. Additional examples of this can be found in (1a) and in (18).

- (11)[^] **kēɲ-à á-lûɲ-i cāɲ kí jèɛɛr-ə̃**
place:SG.DEM-FOC PAST-take.turns-ATP.SGL sun PREP shine-NOM
kāa ɟāaal-ání úgɔ́ɟ̥-ē jwāaat-é pínⁱ
CONJ man:SG-PREV cloth:SG-3SG strip.off-3SG down
‘At the time that the sun took its turn to shine, then the man took off his coat.’

ⁱ <<place here sound ex11.wav>>

In the following sections, we will lay out other inflections for each of the seven verb classes in each of the four TAM forms.

3.2. Iterative

The iterative is a morphological process, whereby repeated action is marked through inflection on the transitive verb. Illustration (12) provides an example of the past tense iterative (12b), alongside the corresponding basic past tense form (12a). As seen from this example, there is no difference in syntactic structure.

- (12) a. **cāak á-māat̚ⁱ**
milk PAST-drink
‘Smb. drank milk.’
- b. **cāak á-mát̚-īⁱⁱ**
milk PAST-drink-ITER
‘Smb. drank milk repeatedly.’

i <<place here sound ex12a.wav>>

ii <<place here sound ex12b.wav>>

Inflection for iterative formation can be combined with each of the TAM forms laid out in Section 3.1. Table 5 presents the forms for each of the seven verb classes. As seen from the examples, the iterative is marked on the verb through a suffix plus stem-internal markers.

Table 5. The inflections for the iterative in each of the four tense forms, for each of the seven verb classes. The classes are represented by {ɲɔl} ‘cut’, {lɛɲ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɲ} ‘throw’, {maat} ‘drink’, {mɔɔt} ‘greet’.

Iterative	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲɔl-ì	ú-ɲɔl-ò	ù-ɲɔl-ò	ú-ɲɔl-ì
Fixed Short / Low Fall	á-lɛɲ-ì	ú-lɛɲ-ò	ù-lɛɲ-ò	ú-lɛɲ-ì
Short w. Grade / Low	á-cáam-ì	ú-cáam-ò	ù-cáam-ò	ú-cáam-ì
Short w. Grade / Low Fall	á-mál-ì	ú-mál-ò	ù-mál-ò	ú-mál-ì
Long / Low	á-kéel-ì	ú-kéel-ò	ù-kéel-ò	ú-kéel-ì
Long / Low Fall	á-mát-ì	ú-mát-ò	ù-mát-ò	ú-mát-ì
Long / High Fall	á-mât-ì	ú-mât-ò	ù-mât-ò	ú-mât-ì

The past tense iterative involves the Low-toned suffix /-ì/, and a High tone on the monosyllabic stem, unless the verb is a member of High Fall class, in which case the stem syllable carries the Low Fall. The length of the stem vowel in the iterative is either short (V) or long (VV), but there are some complications, to the effect that a discussion by verb class is warranted. The Fixed Short classes have a short stem vowel. As for the other classes, the three Long classes do not pattern together in the iterative, and neither do the two Short with Grade classes. The Long / Low verbs all have a long vowel in the iterative. Additional examples appear in (13).

- (13) á-góoc-ìⁱ á-lɛɲ-ìⁱⁱ á-dóok-ìⁱⁱⁱ á-kóok-ì^{iv}
 {góoc} ‘hit’ {lɛɲ} ‘throw’ {dóok} ‘lift’ {kóok} ‘remunerate’

i <<place here sound ex13a.wav>>

ii <<place here sound ex13b.wav>>

iii <<place here sound ex13c.wav>>

iv <<place here sound ex13d.wav>>

For the Long / Low Fall verbs, we find a short vowel in the iterative, as illustrated by the forms of {maat} ‘drink’ in Table 5. Assuming that the members of this class have a phonologically long root vowel (cf. Section 2), this means that the Long / Low Fall verbs display morphological vowel shortening in the iterative. Additional examples appear in (14). Note also, however, that root vowels /ɪ, e, ʊ, o/ lower in quality to the corresponding mid-height [-ATR] vowel. Underlying /ɪ, e/ change to /ɛ/, and underlying /ʊ, o/ to /ɔ/. In (14), these changes are illustrated by {gɪɪr}, {cool}, {lʊʊɲ}, and {kʊʊt}.

- (14) a. **á-kót-ìⁱ** b. **á-tál-ìⁱⁱ** c. **á-lón-ìⁱⁱⁱ**
 {kuut} ‘blow’ {taal} ‘cook’ {luun} ‘pluck’
 d. **á-gér-ì^{iv}** e. **á-cól-ì^v** f. **á-ḡáp-ì^{vi}**
 {gɪr} ‘turn around’ {cool} ‘pay for’ {ḡaap} ‘hang’

ⁱ <<place here sound ex14a.wav>>

ⁱⁱ <<place here sound ex14b.wav>>

ⁱⁱⁱ <<place here sound ex14c.wav>>

^{iv} <<place here sound ex14d.wav>>

^v <<place here sound ex14e.wav>>

^{vi} <<place here sound ex14f.wav>>

In the case of the Long / High Fall verbs as well, the stem vowel is short in the iterative form of most of its members, just as in the case of the Long / Low Fall verbs. Additional examples can be found in (15). Note how the vowel of {luun} shifts to /u/. For this class again, we find that the root vowels /ɪ,e/ and /u,o/ do not surface as such.

- (15) a. **á-lûn-ìⁱ** b. **á-mâm-ìⁱⁱ** c. **á-kîl-ìⁱⁱⁱ**
 {luun} ‘take turns’ {maam} ‘concede’ {kiil} ‘ration’

ⁱ <<place here sound ex15a.wav>>

ⁱⁱ <<place here sound ex15b.wav>>

ⁱⁱⁱ <<place here sound ex15c.wav>>

While the facts relating to length and quality of the stem vowel may appear to be unrelated, there is a common characteristic: the formation of the iterative never results in a short vowel with the quality /ɪ,e,u,o/, that is, the closed [-ATR] vowels and the half-open [+ATR] vowels. In the case of the Long/Low class, we see that this configuration is avoided by the vowel not shortening, as in (13). In the case of the Long/ Low Fall (14) and Long/High Fall (15) classes, the same constellation is avoided by the vowel shifting in quality – to half-open [-ATR] /ɛ,ɔ/ or to closed [+ATR] /i,u/. We hypothesize that the inventory of vowels is restricted when vowel length is short, i.e., that in inflected verb forms the full inventory of 10 vowel phonemes is only available on long and overlong vowels. Further support for this interpretation will follow below (Sections 3.3.1 and 4.2).

Finally, most Short with Grade / Low verbs have a phonologically long vowel in the iterative, and they also display nasalisation of the root-final consonant. But this is not entirely regular; there are also members of this class that have a short vowel and no nasalisation. This is illustrated by the additional examples in (16).

- (16) a. **á-ḡáan-ìⁱ** b. **á-kák-ìⁱⁱ** c. **á-nÁḡ-ìⁱⁱⁱ** d. **á-táj-ì^{iv}**
 {jak} ‘pull’ {kak} ‘split’ {nAk} ‘kill’ {taj} ‘apply marks’

ⁱ <<place here sound ex16a.wav>>

ⁱⁱ <<place here sound ex16b.wav>>

ⁱⁱⁱ <<place here sound ex16c.wav>>

^{iv} <<place here sound ex16d.wav>>

The other three TAM patterns do not present further irregularities. The future tense iterative diverges from the past tense only in terms of the prefix (cf. Table 5). The perfective and imperfective are identical to the past and future in terms of vowel quality and vowel length of the stem syllable, but they differ in the tonal specification. Both have the Low Fall for all verb classes apart from Long / High Fall – these verbs have the Low toneme. The pattern of affixation involves the prefix /ú-/ for perfective iterative, /ù-/ for imperfective iterative, and weak /-ə/ for both.

While the iterative inflection is productive, there are some exceptions. First, repeated action may be expressed through the lexicon rather than through the morphology. The Long / Low verb {gɔɔc} ‘hit’ – basic past tense **á-gɔɔc** – is a case in point. It does not have an iterative inflection. Instead, there is **á-pwɔt**, from {pwot} ‘hit repeatedly, beat up’. Second, there are a few verbs whose meaning involves repeated action, and which are only found with the /-i/ suffix. Two examples are presented in (17). The past tense of these verbs ends in /-i/, just as is in the regularly inflected iterative. Additional cases include {pwoŋ} ‘teach’ and {cɛɛt} ‘chase’.

- (17) a. **dâk á-rũŋⁱ**
 pot PAST-rattle
 ‘Somebody made a rattling
 noise on the cooking pot.’
 b. **jāaɬ á-nĩŋⁱⁱ**
 tree PAST-shake
 ‘Somebody shook the tree.’

ⁱ <<place here sound ex17a.wav>>

ⁱⁱ <<place here sound ex17b.wav>>

3.3. Spatial deixis

Aside from morphological marking of deixis in terms of time structure, Shilluk also presents morphological marking of deixis in spatial orientation. This phenomenon, of conveying directionality or movement through morphological marking on the verb, is common in Nilotic languages (Reh 1996, Dimmendaal 2003, Mietzner 2007). At issue here is the notion of movement away from a point of reference that is obvious in the discourse (centrifugal or itive), or, to the contrary, movement towards that point of reference (centripetal or ventive). Illustration (18) presents an example of this in the second clause, where the centripetal inflection changes the meaning of {cwɔol} ‘call’ to ‘call to come’. The point of reference here is the people who call.

- (18)[^] **jíi mǎɬ-à ɖɔk kàl /**
 PRON2SG greet:ATP.SGL-FOC mouth compound /
 ù jí cwɔool kàlⁱ
 CONJ PRON2SG call:PET compound
 ‘At the entrance to the compound you call out a greeting once, and then they
 call you to come into the compound.’

ⁱ <<place here sound ex18.wav>>

In this example, the centripetal movement refers to the path of **jíi**, the 2nd singular pronoun, the constituent in the Object slot. This is characteristic for verbs like ‘call’, ‘roll’, and ‘throw’, i.e., verbs whose internal argument can be oriented differently

relative to the point of reference in terms of spatial orientation. For such verbs, the inflection for spatial deixis refers to the path of the argument in the Object slot. However, spatial deixis is fully productive in Shilluk, to the effect that it equally applies to verbs with meanings such as ‘eat’, ‘roast’, and ‘greet’, where the argument in the Object slot cannot be easily conceived of as undergoing movement. For such verbs, the morphological marking for spatial deixis is still available, and the directionality is interpreted in relation to the Subject(Agent). Here, directionality refers to movement in advance of the event taking place (cf. Dimmendaal 2003:94). This is illustrated in (19): note that spatial deixis relates to the path of the Subject(Agent) Deng, rather than the path of the Object, i.e., the fish.

- (19)ⁱ dēɛŋ mɔ̀ɔk á-cǎam-é gól-ēⁱ
 Deng kind.of.fish PAST-eat:FUG-3SG compound:CS-3SG
 ‘As for Deng, he went to eat the fish in his compound.’

ⁱ <<place here sound ex19.wav>>

When the verb is inflected for spatial deixis, the destination can be left unspecified, or it can be expressed in the clause, as in (18) and (19). As seen from these examples, the destination is an internal argument here. This means that spatial deixis is a valency-increasing operation. In fact, there is no preposition in Shilluk that has a meaning equivalent to English ‘to(wards)’. Instead, the expression of a destination requires the use of spatial deixis on the verb. In the following subsections, we will lay out the pattern of morphological exponence of spatial deixis (Section 3.3.1), and describe a non-productive semantic extension of this pattern of inflection, in the domain of telicity (Section 3.3.2).

3.3.1 The morphological marking of spatial deixis

The morphological marking of spatial deixis is purely stem-internal, involving vowel length, tone and ATR. For some verbs, there is both a centrifugal and a centripetal form; for other verbs, only a single inflection is available, conveying movement without directionality. Which of these situation applies depends on the vowel of the verb root. We will consider each of these scenarios in turn.

First, if the vowel of the underlying verb root is [-ATR] – that is, one of /ɪ,ɛ,a,ɔ,u/ – then spatial deixis is specific in its direction relative to the point of reference, i.e., both centrifugal and centripetal inflections are available. This is illustrated in Table 6. Forms marked for spatial deixis carry the same tense-marking prefixes found in the corresponding unmarked forms (cf. Table 3). In the past tense, this marking is the prefix /á-/. The difference with the forms that are not marked for spatial deixis resides in the stem syllable. A first marker is lengthening of the root vowel. The stem vowel is overlong, unless the verb is a member of a Fixed Short class. This is illustrated in Tables 6 and 7. Another marker is the specification for tone: six of the seven classes have the Late Fall in the past tense forms marked for spatial deixis. The Long / High Fall class is divergent: its members have the Low Fall here, as seen from {luɔŋ} ‘take turns’ in Table 6.

Table 6. Inflections for spatial deixis for five verbs with a [-ATR] root vowel.

	Past centrifugal	Past centripetal	Verb	Verb class
a. ⁱ	á- lɔ̌ ɲ	á- lú ɲ	{lɔɲ} ‘change (dress)’	Fixed Short / Low
b. ⁱⁱ	á- lɛ̌ ɲ	á- lí ɲ	{lɛɲ} ‘drum’	Fixed Short / Low Fall
c. ⁱⁱⁱ	á- cá aaɲ	á- cÁ aaɲ	{cam} ‘eat’	Short with Grade /
d. ^{iv}	á- lú uɲ	á- lú uɲ	{lɔuɲ} ‘pluck’	Low
e. ^v	á- lú uɲ	á- lú uɲ	{lɔuɲ} ‘take turns’	Long / Low Fall Long / High Fall

ⁱ <<place here sound table6a.wav>>

ⁱⁱ <<place here sound table6b.wav>>

ⁱⁱⁱ <<place here sound table6c.wav>>

^{iv} <<place here sound table6d.wav>>

^v <<place here sound table6e.wav>>

As seen from the examples in Table 6, the inflection for centripetal deixis differs from the corresponding centrifugal in the ATR value of the vowel. Whereas the centrifugal inflection reflects the [-ATR] vowel of the root, the centripetal has a [+ATR] vowel. Most often it is the corresponding [+ATR] vowel, but in some cases there is also an increase in vowel height involved. ATR and the phonetically similar phenomenon of voice quality are involved in the morphological marking of spatial deixis in several Nilotic languages, including Dinka (Andersen 1992-1994), Anywa (Reh 1996), and Southern Nilotic Keyo (Mietzner 2007).

Moreover, for the Fixed Short classes, if the [-ATR] vowel is mid-height (/ɛ,ɔ/), then the change to [+ATR] in the centripetal inflection is accompanied by a raising in vowel height, yielding /i/ for a front root vowel and /u/ for a back root vowel. Here again, as in the iterative (Section 3.2), derivational outcomes involving short /ɪ,e,ʊ,o/ are avoided.

Second, there are the verbs whose root vowel is [+ATR]. Given that a change in vowel quality to [+ATR] is the sole exponent distinguishing the centripetal from the centrifugal, there is no way in which these forms can be distinguished if the root vowel is [+ATR] to begin with. Examples include the verb {keel} ‘spear’ (Long / Low) and {mAAɬ} ‘greet’ (Long / High Fall). Their past-tense forms with marking for spatial deixis are **ákééel** and **á-mAAɬ**, respectively. For verbs like these the inflectional marking for spatial deixis conveys that movement is involved, but the orientation of this movement relative to the point of reference is not morphologically encoded on the verb.

Moving on from the past tense to the other TAM patterns, spatial deixis in the future tense involves the same stem-internal markers as in the past tense; the only difference is the tense-marking prefix, which is /ú-/ in the future tense. This is shown in Table 7.

Table 7. The inflections for spatial deixis in each of the four TAM forms for each of the seven verb classes. The underlined forms, i.e., the Low Fall verbs, are ambiguous with the corresponding forms unmarked for spatial deixis. The classes are represented by {ɲɔɪ} ‘cut’, {lɛɲ} ‘drum’, {cam} ‘eat’, {mAl} ‘roast’, {lɛɛɲ} ‘throw’, {maat} ‘drink’, {mAAɬ} ‘greet’.

Spatial deixis	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ŋɔ́l	ú-ŋɔ́l-ò	ù-ŋɔ́l-ò	ú-ŋɔ́l
Fixed Short / Low Fall	á-léŋ	<u>ú-léŋ-ò</u>	<u>ù-léŋ-ò</u>	ú-léŋ
Short w. Grade / Low	á-cáaam	ú-cáaam-ò	ù-cáaam-ò	ú-cáaam
Short w. Grade / Low Fall	á-máaál	<u>ú-máaál-ò</u>	<u>ù-máaál-ò</u>	ú-máaál
Long / Low	á-léεεŋ	ú-kêeel-ò	ù-kêeel-ò	ú-léεεŋ
Long / Low Fall	á-mâaaɬ	<u>ú-mâaaɬ-ò</u>	<u>ù-mâaaɬ-ò</u>	ú-mâaaɬ
Long / High Fall	á-máaɬɬ	ú-máaɬɬ-ò	ù-máaɬɬ-ò	ú-máaɬɬ

The situation is more complex in the perfective and imperfective tense forms. Again, the prefixes are the same as in the forms not marked for spatial deixis, i.e., /ú-/ in the perfective, and /ù-/ in the imperfective. In the stem syllable, tone is the sole marker of the difference between perfective and imperfective forms marked for spatial deixis vs. the corresponding forms that are not marked in this way. This is illustrated in Table 8, on the basis of the imperfective of Long verbs. Members of the Low classes like {léεŋ} in Table 8 have the Low toneme in the imperfective, which is specific to their tonal class. This class-specific toneme is replaced in the imperfective centrifugal by the Low Fall, which here marks spatial deixis, overriding the lexical specification for tone. For members of the Low Fall classes like {maat} ‘drink’, we also find the Low Fall in imperfective centrifugal. In this case, however, the class-specific tone specification in the basic imperfective tense is the same. As a result, a form like ù-mâaaɬ-ò is morphologically ambiguous, and the communication of movement is clear only if a destination is added. Finally, the Long / High Fall verbs have a different specification for tone in the imperfective centrifugal, as compared to all of the other classes: they take the Low tone.

Table 8. Inflections for imperfective and imperfective centrifugal for three Shilluk verbs.

Imperfective	Imperfective centrifugal	Verb	Verb class
ù-léεεŋ-ɔ	ù-léεεŋ-ò	{léεŋ} ‘throw’	Long / Low
ù-mâaaɬ-ò	ù-mâaaɬ-ò	{maat} ‘drink’	Long / Low Fall
ù-máaɬɬ-ɔ	ù-máaɬɬ-ò	{máaɬ} ‘greet’	Long / High Fall

As illustrated in Table 8, we hypothesize that there is syncretism in the imperfective of Low Fall verbs, i.e., that base forms and forms marked for spatial deixis are not distinguished morphologically, whereas they are distinguished for other verb classes, and that the situation is the same in the perfective. To test this hypothesis, we carried out a small listening test, in which three native speakers of Shilluk were presented with the basic perfective and imperfective forms, and with corresponding forms involving spatial deixis, without a destination being included. They were asked to determine whether the event referred to by the utterance involved movement. The materials consisted of three Low verbs and three Low Fall ones, matched for grade. The overall correct classification scores were 87 percent for the stimuli involving Low verbs (39 judgments in total). For the stimuli involving Low Fall verbs, the score was only 59 percent (57 judgments in total), i.e., close to chance-level. The considerable difference

between these scores supports our interpretation that, for Low Fall verbs, there is ambiguity between the basic perfective and imperfective forms and the corresponding forms that are marked for spatial deixis, when the clause does not include a destination. Table 7 summarises the inflections marking spatial deixis in each of the four TAM forms. If the root vowel is [-ATR], then the form given in Table 7 conveys centrifugal deixis, and there is a corresponding centripetal form, distinguished by a change to [+ATR]. In the case of half-open Fixed Short verbs, they are also distinguished by vowel raising. If, in contrast, the root vowel is [+ATR], then the form given in Table 7 merely conveys spatial directionality, without orientation relative to a point of reference.

The patterns of morphological marking reveal two instances where the range of morphological contrasts is restricted by the lexical specification of the verb root. First, because a vowel change to [+ATR] distinguishes the centripetal form from the centrifugal one, this contrast is only available for roots with a [-ATR] vowel. Second, because in the imperfective and in the perfective the Low Fall is the morphological exponent of spatial deixis, spatial deixis can only be marked if the root vowel does not carry the Low Fall lexically.

Finally, there are a few verbs where spatial deixis is at the core of the lexical meaning, and where its morphological marking is unpredictable. For example, the verb {kɔl} ‘carry (away)’ (Short with Grade / Low) is inherently centrifugal. Exceptionally, the verb changes to á-kíɬ when a destination is specified, and the forms with pattern of exponence for spatial deixis (e.g. the past tense form á-káɬɬ) express centripetal deixis.

3.3.2 The semantic extension of spatial deixis to telicity

There is a lexically restricted set of transitive verbs, for which the pattern of inflection laid out in Section 3.3.1 does not convey spatial deixis but rather telicity. Examples are presented in (20). In each of these, there is sustained action over a period of time, with an outcome specific to the lexical meaning of the verb. The common denominator in these forms and others like them is telicity: sustained actions that lead to a well-defined end point. Dimmendaal (2003:96) has noted that telicity is a common semantic extension of spatial deixis. Just as spatial deixis conveys a directionality in the domain of space, telicity conveys a directional time process, resulting in a salient goal.¹⁰

- | | |
|---|---|
| <p>(20) a. mâac á-kuuɬⁱ
 fire PAST-blow:FUG
 ‘Somebody started the fire.’</p> | <p>b. líɲ á-cwâaakⁱⁱ
 conflict PAST-feed.fire:FUG
 ‘Somebody made conflict break out.’</p> |
| <p>c. môk-ð á-báaakⁱⁱⁱ
 alcohol-SG PAST-ferment:FUG</p> | <p>d. kêɲ-ð á-páaak pín^{iv}
 shrine-SG PAST-break.down:FUG ground
 ‘They broke down the shrine.’¹¹</p> |

¹⁰ Regarding parallel between space and time, note that the same preposition **kɪ** introduces adverbial arguments in space and in time: e.g. **kɪ léw** ‘in the dry season’ and **kɪ kêɲ** ‘in this place’, just as in English.

¹¹ In (20c), the verb refers to the taking down of a shrine for the Shilluk king. This activity is carried out by designated members of the community, each responsible for a component of the dismantling of the shrine, until the dismantling is completed.

‘Somebody got the alcohol to
ferment.’

i <<place here sound ex20a.wav>>

ii <<place here sound ex20b.wav>>

iii <<place here sound ex20c.wav>>

iv <<place here sound ex20d.wav>>

Some of the verbs in which the inflection for spatial deixis conveys telicity are only found with this inflectional marking. For such verbs, including the verbs in (20c,d), it is impossible to determine their verb class. However, some other such verbs are also found in the base form. The other two verbs in (20a,b), {kʉʉt} ‘blow’ (Long / Low Fall) and {cwaak} ‘feed fire’ (Long / High Fall), are also found in the full range of inflections. In the case of {cwaak}, its Long / High Fall class membership is already evident from the tonal specification of the centrifugal form in (20b), and it is confirmed by other forms such as the imperfective, which is ð-cwǎak-5.

4. Valency-increasing operations

Aside from spatial deixis, two other valency-increasing operations are also productive in Shilluk transitive verbs: the applicative and the benefactive. They are described in Sections 4.1 and 4.2, respectively.

4.1 Applicative

The applicative promotes an argument that can be expressed as a prepositional phrase to an internal argument of the verb. One such argument is the instrument. As seen from (21a), an instrument can be introduced by the preposition **kí**, without any inflectional marking on the verb. However, there is also a morphosyntactic structure in which the instrument appears as an internal argument, i.e., without a preposition. This is illustrated in (21b). The instrument noun phrase appears in clause-initial position, displacing the object (patient), which now follows the verb instead. This increase in valency and the relation between verb arguments and semantic roles is signposted on the verb, through a set of morphophonological markers on the stem syllable.

- (21) a. **kwān á-cǎm kí pāalⁱ**
porridge PAST-eat PREP spoon
‘Somebody ate the porridge with a spoon.’
b. **pāal á-cāam kwānⁱⁱ**
spoon PAST-eat:APPL porridge
‘Somebody ate the porridge with a spoon.’

i <<place here sound ex21a.wav>>

ii <<place here sound ex21b.wav>>

Illustration (22) presents an example from a narrative of the same applicative stem form that appears in (21b), now in a relative clause headed by **ákǎeló** ‘sorghum noodles’, which is ‘instrument’ that appears as an internal argument, displacing **mɔɔk** ‘kind of fish’ in preverbal position.

(22)[^] **kāa ù-tààtò** **kí ákěeló** **mé-cāaam** **mòokⁱ**
 CONJ IMPF-cook:ATP.DUR PREP sorghum.noodles MODIF.SG-eat:APPL kind.of.fish
 ‘And then she cooks sorghum noodles to eat the fish with.’

ⁱ <<place here sound ex22.wav>>

The inflections for applicative in the four prefix-marked TAM forms are presented in Table 9. Note that the patterns of exponence are exclusively of a stem-internal nature. If the verb varies in vowel length within its inflectional paradigm (cf. Table 3), then the stem vowel is in the long grade, i.e., overlong. In the past tense applicative, the stem syllable carries the Mid toneme in the case of Low and High Fall classes, and the High Fall to Mid for the Low Fall classes. As in most other inflections, the future applicative has the same stem form as the corresponding past tense form, but with prefix /ú-/ instead of /á-/. The perfective applicative is very similar to the corresponding future tense, the only difference being tone: the perfective applicative has the same tonal specifications as the small-clause infinitive form: Low for Low verbs, Low Fall for Low Fall verbs, High Fall for High Fall verbs.

In the imperfective there is no prefix, the stem form is the same as in the past tense applicative, and there is a suffix /-ā/. Interestingly, a Mid tone is also found as the end target of the applicative forms for past and future tenses. This is in keeping with a diachronic account in which the stem-internal morphology of West Nilotic languages has its origin in lost suffixes (Andersen 1990). In this case, the hypothesis of a Mid-toned suffix at an earlier stage is supported by the presence of a Mid tone on /-ā/ in the imperfective. The pattern of marking of the imperfective applicative parallels that of the imperfective benefactive (cf. Section 5.2).

Table 9. The inflections for the applicative in each of the four TAM forms for each of the seven verb classes. The classes are represented by {ɲɔl} ‘cut’, {lɛŋ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɛŋ} ‘throw’, {maat} ‘drink’, {māat} ‘greet’.

Applicative	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲɔl	ú-ɲɔl	ɲɔl-ā	ú-ɲɔl
Fixed Short / Low Fall	á-lɛŋ̃	ú-lɛŋ̃	lɛŋ̃-ā	ú-lɛŋ̃
Short w. Grade / Low	á-cāaam	ú-cāaam	cāaam-ā	ú-cāaam
Short w. Grade / Low Fall	á-māāāā	ú-māāāā	māāāā-ā	ú-māāāā
Long / Low	á-kēeel	ú-kēeel	kēeel-ā	ú-kēeel
Long / Low Fall	á-māāat̃	ú-māāat̃	māāat̃-ā	ú-māāat̃
Long / High Fall	á-māāat̃	ú-māāat̃	māāat̃-ā	ú-māāat̃

The applicative is also used when certain adverbial arguments are promoted to internal arguments. The morphologically unmarked structure to express adverbial arguments – relating to either space or time – involves a prepositional phrase, introduced by **kì**.¹²

¹² This Low-toned preposition is not to be confused with the segmentally identical but High-toned preposition **kí**, which introduces arguments such as instruments (21b,22). The preposition **kí** also introduces patients when they appear as a peripheral argument to an intransitive or antipassive verb, as in (11) or (22).

The use of the deictic preposition **kì** is illustrated in (23a). Example (23b) shows the corresponding applicative construction, where the adverbial argument is raised to an internal argument.

- (23) a. **kwān á-cām kì kâalⁱ**
 porridge PAST-eat PREP cattle.camp
 ‘Somebody ate porridge in the cattle camp.’
 b. **kâal-à á-cāaam kwānⁱⁱ**
 cattle.camp-FOC PAST-eat:APPL porridge
 ‘The cattlecamp is where somebody ate the porridge.’

ⁱ <<place here sound ex23a.wav>>

ⁱⁱ <<place here sound ex23b.wav>>

Whether it is a deictic argument that is promoted to core argument (23b), or rather an instrument (21b), in both cases the verb is in the applicative. In the verb that appears in these examples – the Short with Grade / Low verb {cam} ‘eat’, the stem vowel is in the long grade, and the toneme on the stem syllable is Mid. Also, in both cases the promoted argument appears before the verb without a preposition, and the displaced patient follows the verb. The difference is that, for the deictic constituent to be used with the applicative, it needs to take a focus-marking suffix /-à/. This suffix reflects a marked information structure, involving narrow focus on the preverbal argument. Two more examples of applicative verb forms preceded by a deictic constituent are presented in (24): with the Short with Grade / Fall verb {maɪ} ‘roast’ in (24a), and with the Long / High Fall verb {maɪt} ‘greet’ in (24b).

- (24) a. **kâal-à á-máaɪ bjélⁱ**
 cattle.camp-FOC PAST-roast:APPL sorghum
 ‘The cattle camp is where somebody roasted sorghum.’
 b. **kâal-à á-máaɪt twóŋⁱⁱ**
 cattle.camp-FOC PAST-greet:APPL Twong
 ‘The cattle camp is where somebody greeted Twong.’

ⁱ <<place here sound ex24a.wav>>

ⁱⁱ <<place here sound ex24b.wav>>

The suffix /-à/ can also be used to emphasize a deictic constituent in post-verbal position, but then the verb is not in the applicative. The focus-marking suffix then attaches to the verb, without additional stem-internal changes. Two examples are presented in (25), showing the past and perfective TAM forms of {cam} ‘eat’, both with the /-à/ suffix.

- (25) a. **kwān á-cām-à kâalⁱ**
 porridge PAST-eat-FOC cattle.camp
 ‘Somebody ate sorghum specifically in the cattle camp.’

- b. **kwān ú-càaam-ò-à¹³ kâalⁱⁱ**
 porridge PERF-eat-PERF-FOC cattle.camp
 ‘Somebody apparently ate grain specifically in the cattle camp.’

ⁱ <<place here sound ex25a.wav>>

ⁱⁱ <<place here sound ex25b.wav>>

4.2. Benefactive

The valency structure of a transitive verb can also be increased through the addition of an argument referring to a recipient or a beneficiary. Illustration (26) presents an example from a narrative, in the main clause. The beneficiary is the 1st singular pronoun that precedes the verb. The patient, **tónj** ‘spear’, which appears before the verb in the basic transitive construction, follows after the verb. But this order is not fixed: when the verb is inflected for benefactive, it may also be that the patient precedes it and the beneficiary follows it.

- (26)[^] **jám-ání kàa rúm gé jôoot-ò ìi jáa /**
 things-PREV WHEN finish PRON3PL find-NOM ERG PRON1SG /
jáa á-tôot-ì tónjⁱ
 PRON1SG PAST-hand-BNF spear
 ‘When I had found those things, they handed me a spear.’

ⁱ <<place here sound ex26.wav>>

The expression of a recipient or a beneficiary requires the use of the benefactive: there is no alternative syntactic construction in which the beneficiary is expressed differently, e.g. by means of a prepositional phrase. In this respect, the benefactive is like the marking of a destination / goal through spatial deixis, and unlike the applicative. In what follows we describe the pattern of exponence of the benefactive, first for the past tense, and then for the other three TAM forms. The forms are summarised for each verb class in Table 10.

Table 10. The inflections for benefactive in each of the four tense forms for each of the seven verb classes. The classes are represented by {ɲɔl} ‘cut’, {lɛŋ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɛŋ} ‘throw’, {maat} ‘drink’, {mɔɔt} ‘greet’.

Benefactive	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲúl-ì	ú-ɲúl-ò	ɲúl-à	ú-ɲúl-ì
Fixed Short / Low Fall	á-líŋ-ì	ú-líŋ-ò	líŋ-à	ú-líŋ-ì
Short w. Grade / Low	á-cám-ì	ú-cám-ò	cám-à	ú-cám-ì
Short w. Grade / Low Fall	á-mál-ì	ú-mál-ò	mál-à	ú-mál-ì
Long / Low	á-kéel-ì	ú-kéel-ò	kéel-à	ú-kéel-ì
Long / Low Fall	á-mát-ì	ú-mát-ò	mát-à	ú-mát-ì
Long / High Fall	á-mât-ì	ú-mât-ò	mât-à	ú-mât-ì

¹³ The phonological sequence **ú-càaam-ò-à** is realised [ú-càaam-àa].

With respect to the pattern of morphological exponence, the benefactive shares most of its exponence with the iterative. In the past tense, both involve the Low-toned suffix /-ì/, and a High tone on the stem syllable, unless the verb is a member of High Fall class, in which case the stem has the Low Fall. These first two markers are the same for iterative and benefactive. Third, the stem vowel is either short or long. In this respect, the benefactive is identical to the iterative for the great majority of verbs.¹⁴ A fourth marker of the benefactive relates to the vowel of the stem syllable. In this respect the benefactive and the iterative diverge. Additional examples of the benefactive are presented in Table 11.

Table 11. Additional examples of the past tense benefactive.

	Benefactive	Verb	Verb class
a.	á-ŋíc-ì ⁱ	< {ŋic} ‘recognise’	Short with Grade / Low
b.	á-léεŋ-ì ⁱⁱ	< {lεεŋ} ‘throw’	Long / Low
c.	á-góoc-ì ⁱⁱⁱ	< {gɔɔc} ‘hit’	Long / Low
d.	á-ḍóok-ì ^{iv}	< {ḍook} ‘lift’	Long / Low
e.	á-lúŋ-ì ^v	< {lɔɔŋ} ‘pluck’	Long / Low Fall
f.	á-téεŋ-ì ^{vi}	< {tεεŋ} ‘dust’	Long / Low Fall
g.	á-méεŋ-ì ^{vii}	< {mεεŋ} ‘illuminate’	Long / Low Fall
h.	á-lúŋ-ì ^{viii}	< {lɔɔŋ} ‘take turns’	Long / High Fall

ⁱ <<place here sound table11a.wav>>

ⁱⁱ <<place here sound table11b.wav>>

ⁱⁱⁱ <<place here sound table11c.wav>>

^{iv} <<place here sound table11d.wav>>

^v <<place here sound table11e.wav>>

^{vi} <<place here sound table11f.wav>>

^{vii} <<place here sound table11g.wav>>

^{viii} <<place here sound table11h.wav>>

There is a change in the quality of the stem vowel, just like in the marking of centripetal spatial deixis (see Section 3.3.1). For all verbs that have a [-ATR] root vowel, the ATR value changes to [+ATR] in the benefactive. This is illustrated along with other changes in Tables 10 and 11. If the vowel is short and half-open, i.e., one of /e, ε, o, ɔ/, then the change to [+ATR] is accompanied by a raising to the corresponding closed vowel, /i/ for front vowels and /u/ for back vowels. This is illustrated in Table 10 by the benefactive derivations of {ɲɔl} ‘cut’ and {lεŋ} ‘drum’.

The length of the vowel in the benefactive is either short (V) or long (VV). All of the Short classes and Short with Grade classes have a short vowel, just as they do in the basic past tense. As for the Long classes, the pattern is inconsistent, with both short and long stem vowels attested in the benefactive. What explains the variability is vowel

¹⁴ The difference is that the Short with Grade / Low verbs consistently have a short vowel in the benefactive, whereas they have a long vowel for several members of this class in the iterative. Compare, for example, benefactive á-cám-ì vs. iterative á-cáam-ì from {cam} ‘eat’, and likewise benefactive á-ɟák-ì vs. iterative á-ɟáaŋ-ì from {jak} ‘pull’.

quality. When the stem vowel is half-open, then the vowel in the benefactive is long. As seen from Table 11, this is the case in verbs such as Long / Low {lɛɛŋ} ‘throw’ and Long / Low Fall {tɛɛŋ} ‘dust’. In contrast, Long verbs that have a closed vowel – e.g. {lɔɔŋ} ‘pluck’ – or an open vowel – e.g. {maat} ‘drink’ – have a short vowel in the benefactive. We hypothesize that Shilluk does not allow for /ɪ,e,ʊ,o/ on short vowels in morphologically derived forms (cf. Section 3.2).¹⁵ Raising in vowel height and the failure to shorten are both ways in which the language avoids this constellation.

The interpretation of morphological shortening of the vowel in the benefactive is in line with other inflections that involve the suffix /-ɪ/. One of these is the iterative inflection (Section 3.2). The suffix also appears in Shilluk nouns, where the plural marker /-ɪ/ never follows an overlong stem vowel. Remijsen, Miller-Naudé & Gilley (2015) present evidence from instrument nouns derived from transitive verbs suggesting that, just like in the benefactive, shortening of stem vowels followed by the plural marker /-ɪ/ depends crucially on the vowel quality in the stem syllable.

In summary, the main template for the past tense benefactive is á-CV_[+ATR]C-ɪ for most classes. The Long / High Fall class deviates from this pattern in that the tone on the stem syllable is the Low Fall rather than the High; and members of Long classes have a long vowel rather than short one if the root vowel is half-open.

The benefactive is also found in the perfective, imperfective and future TAM levels. An overview of the benefactive in all four tenses is presented in Table 10 above. The forms found in the future tense are identical to those in the past tense, apart from the fact the prefix is /ú-/ rather than /á-/. The perfective and imperfective benefactive forms are identical to the corresponding past tense form with respect to vowel length, vowel quality and ATR. The perfective benefactive has the same affixes as in the basic perfective and in the perfective marked for spatial deixis, and the tone is the Low Fall for all inflections other than the Long / High Fall class, whose members have the Low. The imperfective benefactive has the same stem forms as the past tense, including the tonal specification. This is noteworthy: in all of the inflections considered so far, with the exception of the applicative, the imperfective has the same segmental affixes as the perfective. Just as in the applicative (Section 4.1), there is no prefix but there is a suffix /-a/. The syntactic structure of the imperfective benefactive invariably has the beneficiary argument following the suffixed verb. This contrasts with the benefactive forms for the other three tenses, where the order is not fixed. This relates to the functionality of the suffix /-a/, which includes both the marking of focus and increased valency. We will return to it in Section 6.

5. Antipassives

The antipassive reduces the argument structure of the transitive verb to one. Shilluk presents two such derivations. They are fully productive, and are found with frequency

¹⁵ The qualification ‘in derived environments’ is included because short /ɪ,ʊ,e,o/ do occur in roots: **dòk** ‘cows’, although influence from Dinka may be a factor here.

in discourse.¹⁶ The first of the two, which we will label as the durative antipassive, is illustrated in (27) using an elicited example, and in (28) using spontaneously uttered data.

- (27) a. **kwān á-cám ìi bǔulⁱ**
 porridge PAST-eat ERG Bol
 ‘Bol ate the porridge.’
 b. **bǔul á-cààamⁱⁱ**
 Bol PAST-eat:ATP.DUR
 ‘Bol ate.’
 c. **bǔul á-cààam kí kwānⁱⁱⁱ**
 Bol PAST-eat:ATP.DUR PREP porridge
 ‘Bol ate some porridge.’

ⁱ <<place here sound ex27a.wav>>

ⁱⁱ <<place here sound ex27b.wav>>

ⁱⁱⁱ <<place here sound ex27c.wav>>

In the basic transitive structure (27a), the patient is expressed as an internal argument, preceding the verb, and the optional ergative constituent expressing the agent follows the verb. In the corresponding antipassive (27b), the patient is not expressed as an internal argument, and instead we find the agent in the preverbal slot, but without the ergative marker. In the majority of cases when the antipassive is encountered in texts, the patient is not expressed at all: it may be unknown or unspecified. This is illustrated in (27b). However it is possible for it to appear in the clause in a prepositional phrase, i.e., as a non-core constituent. There is a semantic difference between the expression of the patient as the internal argument and its expression in a prepositional phrase. Native-speaker judgments suggest that the latter configuration – in which the patient is expressed through a prepositional phrase – conveys that the patient is affected in part rather than in full, as indicated in the translation for (27c). This judgment matches Fillmore’s (1977:76-77) interpretation of the difference in English between expressing a patient semantic role as an internal argument, as opposed to as a prepositional phrase. The semantic characteristics of the antipassive are discussed at greater length in Miller & Gilley (2001:42-44). Illustration (28) presents an example of the antipassive from a narrative.

- (28)[^] **gé á-bèet / kì bôoorò / jìi á-cààamⁱ**
 PRON3PL PAST-sit / PREP evening / people PAST-eat:ATP.DUR
 ‘They stayed there. In the evening, the people were eating.’

ⁱ <<place here sound ex28.wav>>

Table 12 summarizes the antipassive for the different verb classes and TAM forms. The pattern of morphological marking of the antipassive is stem-internal, involving a package of four phonological properties: vowel quality, vowel length, the coda consonant, and tone. We will start by describing the first three. The majority of transitive verbs have a [-ATR] vowel (/i,ɛ,a,ɔ,u/). These root vowels change to +ATR

¹⁶ We also have some evidence for unaccusative, another valency-decreasing operation. We omit it from discussion here, on three considerations: we have not observed it in narrative discourse; the unaccusative formation is not productive; it is not always clear whether the unaccusative form results from a valency-decreasing operation on transitive verb roots. Instead, it may be that, at least in some cases, the unaccusative form is basic and the transitive verb is derived, through a valency-increasing operation on intransitive roots, i.e., causative.

(/i,e,ʌ,o,u/, respectively) in the antipassive, e.g. {lɛɛŋ} ‘throw’ yields **á-lèeeŋ**, and {cam} ‘eat’ yields **á-cʌʌʌm**. A change in ATR alone would have {ŋɔ} ‘cut’ yielding */ŋot/, and {lɛŋ} ‘drum’ yielding */lɛŋ/. This does not happen: in the case of short half-open vowels, the change to +ATR is accompanied by raising so that {ŋɔ} and {lɛŋ} yield /ŋut/ and /liŋ/, respectively. This combination of a change to +ATR that is accompanied with raising is identical to what happens in the centripetal (Section 3.3.1) and in the benefactive (Section 4.2). Second, when the root syllable has /l/ or /r/ as coda, then the antipassive stem has a coda /t/ (cf. Gilley 1992:85-86). Third, if the transitive verb belongs to a class that is characterized by gradation, then the stem syllable of the antipassive verb has an overlong vowel.

Table 12. The inflections for the durative antipassive in each of the four tense forms for each of the seven verb classes. The classes are represented by {ŋɔ} ‘cut’, {lɛŋ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɛŋ} ‘throw’, {maat} ‘drink’, {mɛɛŋ} ‘illuminate’, and {mʌʌt} ‘greet’.

	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ŋùt	ŋùt-ɔ̌	ù-ŋùt-ɔ̌	ú-ŋùt-ɔ̌
Fixed Short / Low Fall	á-liŋ	liŋ-ɔ̌	ù-liŋ-ɔ̌	ú-liŋ-ɔ̌
Short w. Grade / Low	á-cʌʌʌm	cʌʌʌm-ɔ̌	ù-cʌʌʌm-ɔ̌	ú-cʌʌʌm-ɔ̌
Short w. Grade / Low Fall	á-mʌʌʌt	mʌʌʌt-ɔ̌	ù-mʌʌʌt-ɔ̌	ú-mʌʌʌt-ɔ̌
Long / Low	á-lèeeŋ	lèeeŋ-ɔ̌	ù-lèeeŋ-ɔ̌	ú-lèeeŋ-ɔ̌
Long / Low Fall	á-mʌʌʌt̃	mʌʌʌt̃-ɔ̌	ù-mʌʌʌt̃-ɔ̌	ú-mʌʌʌt̃-ɔ̌
	á-mèeeŋ	mèeeŋ-ɔ̌	ù-mèeeŋ-ɔ̌	ú-mèeeŋ-ɔ̌
Long / High Fall	á-mʌʌʌt̃	mʌʌʌt̃-ɔ̌	ù-mʌʌʌt̃-ɔ̌	ú-mʌʌʌt̃-ɔ̌

The TAM forms other than past tense all have the weak suffix /-ɔ̌/. The prefixes /ú-/ for future and /ù-/ for imperfective are as expected. Less so is the lack of a prefix marking the perfective. Given that the perfective often has the prefix /ú-/ and the weak suffix /-ɔ̌/ in combination with vowel lengthening (see e.g. Tables 4, 8), this could be attributed to homophony avoidance in morphological environments (cf. Baerman 2011): if the expected pattern of inflectional marking had been found, there would have been ambiguity between perfective and future.

As for tone, the forms in Table 12 show that the lexical or class-specific tone patterns are largely overridden in the antipassive, where the Low tone predominates across tenses. There are two exceptions. One of them is the Long / High Fall class, in the perfective and in the imperfective. Just as in the basic transitive form of the same inflections (Table 4), we find the High Fall tone on the stem and the Mid tone on the suffix. For a verb like {mʌʌt} ‘greet’, which has a [+ATR] vowel to begin with, and a coda other than /l,r/, this means that the imperfective antipassive is indistinguishable from the corresponding transitive form. In contrast, in the case of {maan} ‘hate’, also a member of the Long / High Fall class, antipassive /ù-mʌʌʌn-ɔ̌/ is different from transitive /ù-mʌʌʌn-ɔ̌/. Second, the Low Fall verbs display variability: some members of this class, like {maat} ‘drink’ and {ŋaap} ‘hang’, reveal the lexical specification in past and perfective tenses, whereas other verbs, such as {mɛɛŋ} ‘illuminate’, have the Low

tone in all tense forms, as most other classes do. Both patterns are illustrated in Table 12.

There is also a second antipassive, which we will refer to as the single-action antipassive. It involves the same markers of ATR and the stem-final consonant, but the stem vowel is short or long, rather than overlong. This single-action antipassive already appeared in (11,18) above; a third example appears in (29). In terms of meaning, it conveys that the action referred to by the verb occurred only once.

- (29)[^] **kāa dēɛŋ ú-kèet-ò kɪ m̀òk mé-dwǝŋⁱ**
 CONJ Deng IMPF-spear:ATP.SGL PREP k.o.fish MODIF.SG-big
 ‘And then Deng spears a big freshwater rattail.’

ⁱ <<place here sound ex29.wav>>

The full paradigm crossing verb classes with TAM forms appears in Table 13. The stem is largely identical to that of the durative antipassive. The main difference is that the stem shortens, from VV to V where possible. The patterns for vowel length are like in the iterative and the benefactive, with Long stems shortening in vowel length, unless this would result in /e,o,u,ɪ/ on a short vowel. This explains why, in Table 13, {mɛɛŋ} ‘illuminate’ yields /á-mèɛŋ-ì/ rather than */á-mèɛŋ-ì/. The tone is Low, and where it is not, it matches the situation in the durative antipassive: High Fall in the perfective and imperfective tense forms of the High Fall verbs; Low Fall for {maat} ‘drink’, although this is again not consistent across the class. There is syncretism between durative antipassive and single-action antipassive in the perfective forms of Fixed Short classes, for lack of vowel length gradation to mark the difference between them.

It is worthwhile to note how the High tone on the suffix in the future tense forms in Table 13 interacts with the specification on the stem syllable. Inspection of Tables 12 and 13 shows that both the durative antipassive and the single-action antipassive have the Low tone on the stem syllable in most forms. However, the future tense single-action antipassives all have the Mid tone. This is suggestive of a word-internal sandhi process triggered by the non-Low-toned suffix /-í/, whereby the a Low tone on the stem syllable changes to Mid following a non-Low suffix /-í/. The same process needs to be invoked to reconstruct the diachronic development of Mid-toned applicative forms of Low verbs (e.g. /á-kèet/ ‘PAST-spear-APPL’), from a conditioning Mid- or High-toned suffix.

Table 13. The inflections for single-action antipassive in each of the four TAM forms for each of the seven verb classes. The classes are represented by {ɲɔ} ‘cut’, {lɛŋ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɛŋ} ‘throw’, {maat} ‘drink’, {mɛɛŋ} ‘illuminate’, and {malɛt} ‘greet’.

	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲùt-ì	ɲùt-ò	ú-ɲùt-ò	ú-ɲùt-í
Fixed Short / Low Fall	á-lìŋ-ì	lìŋ-ò	ú-lìŋ-ò	ú-lìŋ-í
Short w. Grade / Low	á-càm-ì	càm-ò	ú-càm-ò	ú-càm-í
Short w. Grade / Low Fall	á-māl-ì	māl-ò	ú-māl-ò	ú-māl-í
Long / Low	á-kèet-ì	kèet-ò	ú-kèet-ò	ú-kèet-í

Long / Low Fall tone	á-mâṭṭ-ì	mâṭṭ-ò	ú-mâṭṭ-ò	ú-mâṭṭ-í
	á-mèèṇ-ì	mèèṇ-ò	ú-mèèṇ-ò	ú-mèèṇ-í
Long / High Fall	á-mâṭṭ-ì	mâṭṭ-ò	ú-mâṭṭ-ò	ú-mâṭṭ-í

One of the things that is noteworthy about this derivation is that tense marking is different from other forms of transitive verb roots: the prefix /ú-/ is high-toned in the imperfective. In this respect, these antipassive verbs pattern along with intransitive verb roots that involve motion. As seen from the examples in (30a,b), intransitive verbs that refer to events involving motion have a high-toned /ú-/ prefix in the imperfective, whereas otherwise intransitive verbs have a Low-toned prefix in the imperfective (30c,d).

- (30) a. **bḥul ú-riṇ-òⁱ** b. **câṇ ú-túul-òⁱⁱ**
 Bol IMPF-run sun IMPF-rise
 ‘Bol is running.’ ‘The sun is comping up.’
- c. **bḥul ò-nḥun-òⁱⁱⁱ** d. **bḥul ò-dḥṇ-ò^{iv}**
 Bol IMPF-sleep Bol IMPF-praise
 ‘Bol is sleeping’ ‘Bol is praising.’

ⁱ <<place here sound ex30a.wav>>

ⁱⁱ <<place here sound ex30b.wav>>

ⁱⁱⁱ <<place here sound ex30c.wav>>

^{iv} <<place here sound ex30d.wav>>

6. Subject marking

Most of the examples provided so far involve Shilluk verb forms that are not marked for the Subject(Agent). Overall, Shilluk morphosyntax offers the following options to express the agent of a clause headed by a transitive verb. The agent may be left vague, as in (31a). Alternatively, the agent may be specified through the ergative constituent (cf. Miller & Gilley 2001). This constituent is composed of the marker *ìr*, followed by a noun (31b) or pronoun (31c).¹⁷ In addition, the agent may be expressed through an inflection of the verb, as in (31d). The marking of the Subject(Agent) through verb inflection is the topic of this section.

- (31) a. **câak á-máaṭⁱ** b. **câak á-máaṭ ìr bḥulⁱⁱ**
 milk PAST-drink milk PAST-drink ERG Bol
 ‘Somebody drank the milk.’ ‘Bol drank the milk.’
- c. **câak á-máaṭ ìr génⁱⁱⁱ** d. **câak á-máaṭ-gèn^{iv}**
 milk PAST-drink ERG PRON3PL milk PAST-drink-3PL
 ‘They drank the milk.’ ‘They drank the milk.’

ⁱ <<place here sound ex31a.wav>>

ⁱⁱ <<place here sound ex31b.wav>>

¹⁷ The independent pronouns are all High-toned. When they appear in the ergative constituent they are: *ján* ‘PRON1SG’, *jín* ‘PRON2SG’, *én* ‘PRON3SG’, *wáa* ‘1PL.IN’, *wón* ‘1PL.EX’, *wún* ‘2PL’, *gén* ‘3PL’. In serial verbs, when they appear resumptively between the two verb stems, these personal pronouns appear as *já*, *jí*, *é*, *wá*, *wó*, *wú*, *gé*, respectively. For example: *gé á-claam gé ú-cùṇò* ‘They ate while standing up.’

iii <<place here sound ex31c.wav>>

iv <<place here sound ex31d.wav>>

The pronominal expressions – through a suffix as in (31d) vs. by means of an independent pronoun in the ergative constituent as in (31c) – are in a complementary relationship: the agent can be expressed pronominally either in the former way or in the latter, but not both simultaneously. This means that, in (31d), the phenomenon is to be interpreted as subject marking, rather than as agreement with the Subject(Agent).

Because of this complementary distribution, and because they are so similar in terms of their sound pattern, it is worthwhile to consider if the pronominal form in (31d) could be a clitic rather than a suffix, that is, a phonologically reduced form of the independent pronoun, prosodically attached to the adjacent word. The difference in tone could then be interpreted as an indication of phonological weakening. However, there is syntactic evidence for the suffixal interpretation. In the applicative the object is displaced to the postverbal position, so that it follows immediately after the verb, preceding the optional ergative constituent. This is illustrated in (32a). In contrast, pronominal agents expressed without an ergative constituent follow immediately after the verb, preceding this displaced patient, as in (32b). This state of affairs indicates that the pronoun in (32b) is a suffix, rather than a reduced realisation of the independent personal pronoun that appears in (32a).

- (32) a. **wâŋ-ò á-māŋt bŭul ìr jánⁱ**
letter-SG PAST-greet:APPL Bol ERG PRON1SG
'I greeted Bol by way of a letter.'
- b. **wâŋ-ò á-māŋt-á bŭulⁱⁱ**
letter-SG PAST-greet:APPL-1SG Bol
'I greeted Bol by way of a letter.'

i <<place here sound ex32a.wav>>

ii <<place here sound ex32b.wav>>

Further support for the inflectional interpretation comes from paradigm data for subject marking in different verb classes: suffixation is accompanied by stem-internal alternation. Table 14 shows the paradigms of the seven classes in the basic past tense. Note that the forms inflected for a singular Subject(Agent) have an overlong stem vowel (if the verb has a long grade).

Table 14. The paradigms for the marking of subject marking for each of the seven classes. The classes are represented by {ɲɔl} ‘cut’, {lɛɲ} ‘drum’, {cam} ‘eat’, {mal} ‘roast’, {lɛɲ} ‘throw’, {maat} ‘drink’, {mɔlɔt} ‘greet’.

	Fixed Short / L	Fixed Short / LF	Short w. Grade / L	Short with Grade / LF	Long / L	Long / LF	Long / HF
1SG	á-ɲɔl-á	á-lɛɲ-à	á-càaam-á	á-mɔlɔl-à	á-lɛɛɲ-á	á-mâaat-à	á-mɔlɔlɔt-à
2SG	á-ɲɔl	á-lɛɲ	á-càaam	á-mɔlɔl	á-lɛɛɲ	á-mâaat	á-mɔlɔlɔt
3SG	á-ɲɔl-é	á-lɛɲ-è	á-càaam-é	á-mɔlɔl-è	á-lɛɛɲ-é	á-mâaat-è	á-mɔlɔlɔt-è
1PL.IN	á-ɲɔl-wāa	á-lɛɲ-wāa	á-cām-wāa	á-mɔl-wāa	á-lɛɲ-wāa	á-mâat-wāa	á-mɔlɔt-wāa
1PL.EX	á-ɲɔl- wòn	á-lɛɲ-wòn	á-cām-wòn	á-mɔl-wòn	á-lɛɲ-wòn	á-mâat-wòn	á-mɔlɔt-wòn
2PL	á-ɲɔl- wùn	á-lɛɲ-wùn	á-cām- wùn	á-mɔl-wùn	á-lɛɲ- wùn	á-mâat- wùn	á-mɔlɔt- wùn
3PL	á-ɲɔl-gèn	á-lɛɲ-gèn	á-cām-gèn	á-mɔl-gèn	á-lɛɲ-gèn	á-mâat-gèn	á-mɔlɔt-gèn

The tone on the stem syllable depends on the verb class: it carries the Low tone in Low and High Fall verbs, and the Low Fall in Low Fall verbs. The 1st and 3rd singular forms are marked by a suffix: /-a/ and /-ɛ/, respectively. The tonal specification of these suffixes is also determined by the verb class of the root. These suffixes are Low-toned following roots belonging to the Low Fall and High Fall classes, and High-toned following members of the Low classes. The 2nd singular does not carry a suffix.¹⁸ The class-based divergence in the forms inflected for a singular Subject(Agent) presents a heuristic to determine the class membership of transitive verbs, based on length and tone in the stem syllable and tone in the suffix.

The forms inflected for a plural agent reflect the short grade of the stem vowel; the toneme on the stem is the Low Fall for all classes other than the Long / High Fall class, which takes the High Fall. As seen from Table 14, Shilluk distinguishes in the 1st plural between inclusive (speaker plus addressee) and exclusive (speaker and third party). This inclusive 1st plural is marked by the suffix /-wāa/. Its onset is often elided, so that the 1st plural inclusive forms of e.g. {ɲɔl} ‘cut’ and {lɛɲ} ‘drum’ may be realized [á-ɲɔl-āa] and [á-lɛɲ-āa], respectively.

In relation to the question of the morphological status of agent-marking on the verb – i.e., suffix or clitic – the data in Table 14 show that subject-marking interacts with the stem syllable in several ways, as a function of verb class, number and person. The most compelling piece of evidence is probably the 2nd singular, whose marking is purely stem-internal. Given these interactions, the pronominal marking is to be interpreted as affixation, rather than merely as the weakening of the independent pronouns to clitics: the interactions cannot be attributed to cliticisation in a meaningful way, and therefore support a suffixal interpretation.

¹⁸ The divergence between the verb forms inflected for 2nd singular on the one hand and those inflected for 1st and 3rd singular on the other parallels the situation in related languages (Andersen 1990, Reh 1996).

Further evidence of interactions between the suffixes and the stem syllable is presented in Table 15, which shows some of the paradigms for subject-marking beyond the basic past tense: in the past tense crossed with spatial deixis, applicative, and iterative. These forms are presented for two verbs. The data in Table 15 present somewhat more homogeneity within each paradigm, as compared to the basic past tense forms in Table 14. First, the singular suffixes are consistently High-toned across classes. Second, the forms inflected for a singular Subject(Agent) have the same level of stem vowel length as the corresponding unmarked forms.

Table 15. The paradigms for the subject marking for two classes, each in the past tense combined with spatial, applicative, and iterative. The unmarked form – i.e., not inflected for Subject(Agent) – is included for comparison. The verbs are {cam} ‘eat’ and {mal} ‘roast’.

	Short with Grade / Low			Short with Grade / Low Fall		
	SPATIAL	APPL	ITER	SPATIAL	APPL	ITER
Ø	á-cáaam̃	á-cāaam	á-cāam-ì	á-máll̃l̃	á-máll̃l̃	á-mál-ì
1SG	á-cāaam-á	á-cāaam-á	á-cāam-á	á-máll̃l̃-á	á-máll̃l̃-á	á-mál-á
2SG	á-cāaam	á-cāaam	á-cāam-í	á-máll̃l̃	á-máll̃l̃	á-mál-í
3SG	á-cāaam-é	á-cāaam-é	á-cāam-é	á-máll̃l̃-é	á-máll̃l̃-é	á-mál-é
1PL.IN	á-cāaam-wāa	á-cām-wāa	á-cāam-ì-wāa	á-máll̃l̃-wāa	á-mál-wāa	á-mál-ì-wāa
1PL.EX	á-cāaam-wôn	á-cām-wôn	á-cāam-ì-wôn	á-máll̃l̃-wôn	á-mál-wôn	á-mál-ì-wôn
2PL	á-cāaam-wûn	á-cām-wûn	á-cāam-ì-wûn	á-máll̃l̃-wûn	á-mál-wûn	á-mál-ì-wûn
3PL	á-cāaam-gên	á-cām-gên	á-cāam-ì-gên	á-máll̃l̃-gên	á-mál-gên	á-mál-ì-gên

The pattern of suffixal subject marking on inherently iterative verbs like {niinj} ‘shake’ and {pwoŋ} ‘teach’ involves a Low toneme on the stem syllable, followed by the same suffixal markers as found in subject-marked iterative forms – so e.g. á-niinj-á ‘PAST-shake-1SG’, á-niinj-í ‘PAST-shake-2SG’, etc.

7. Alignment of arguments and the /-a/ suffix

Leaving aside the homophonous 1st singular marker /-a/ (cf. Section 6), the suffix /-a/ has a number of related functions. As seen from (33), it serves as a focus marker on core (33a) and non-core (33b) arguments alike. A salient characteristic is that it may interact with the form of the verb, even when it is suffixed to a different word. First, the focus marker makes it grammatical for the verb to appear without a TAM-marking prefix (33a,b). Second, the presence of the focus marker on a preverbal deictic constituent requires the use of the applicative form of the verb (33d).

- (33) a. kwān-à cāmⁱ
porridge-FOC eat
‘Somebody is eating specifically porridge.’
b. kwān cām kí-à pālⁱⁱ
porridge eat PREP:FOC spoon
‘Somebody eats porridge specifically with a spoon.’
c. kwān ú-cāaamò-à kālⁱⁱⁱ

porridge PERF-eat-FOC cattle.camp
 ‘Somebody apparently ate porridge specifically in the cattle camp.’

- d. **kāal-à á-cāam kwān^{iv}**
 cattle.camp-FOC PAST-eat:APPL porridge
 ‘The cattlecamp is where somebody ate the porridge.’

ⁱ <<place here sound ex33a.wav>>

ⁱⁱ <<place here sound ex33b.wav>>

ⁱⁱⁱ <<place here sound ex33c.wav>>

^{iv} <<place here sound ex33d.wav>>

In addition, the imperfective applicative (Table 9) and benefactive (Table 10) inflections both require this suffix. For example, in the case of {cam} we find **cāam-ā** ‘eat:APPL-FOC’ and **cām-à** ‘eat:BNF-FOC’.¹⁹ Here the characterisation ‘focus marker’ is a misnomer, as it functions as a marker of increased valency. The latter function is also in evidence when /-a/ is used in a clause involving a deictic constituents in the preverbal position, as in (33d).

In this section we describe a further use of this suffix, that shines a light on the diachronic development of Shilluk syntax. As a starting point, it is worth noting that while a past tense form, like the one in (34a), is basic in terms of its function, it nonetheless involves a replacement tonal marking, the High Fall (cf. Table 4). That is, the lexical / class-based specification for tone of the verb is overwritten in this inflection. However, there is a past-tense form in which the underlying specification for tone does show up. An example is presented in (34b). The verb {ɲɔl} ‘cut’ belongs to the Fixed Short / Low class.

- (34) a. **jāaɬ á-ɲɔl ìr bǔulⁱ**
 tree PAST-cut ERG Bol
 ‘Bol has cut the tree.’

- b. **bǔul á-ɲɔl-à jāaɬⁱⁱ**
 Bol PAST-cut-FOC tree
 ‘Bol has cut specifically the tree.’

ⁱ <<place here sound ex34a.wav>>

ⁱⁱ <<place here sound ex34b.wav>>

When requested to translate the English sentence ‘Bol has cut the tree’, our informants invariably produce the sentence in (34a), with the basic past tense form. The sentence in (34b), in contrast, is pragmatically marked, conveying that the patient object is emphasized. Several morphosyntactic characteristics are involved here. At the syntactic level, constituent order is Subject(Agent)-Verb-Object, rather than the unmarked structure of Object-Verb-Subject(Agent). Moreover, the agent is no longer introduced by the ergative marker. At the morphological level, the verb stem is followed by the suffix /-à/, and the stem syllable displays the lexical specification for tone of the root. Additional examples are presented in (35). In (35a), the verb {cam} ‘eat’ belongs to the Short with Grade / Low class, and {mɔl} ‘roast’ in (35b), belongs to the Short with Grade / Low Fall class. Both of these verbs have a long grade – i.e., the stem vowel is overlong

¹⁹ We hypothesize that the verb suffixes in these verb forms are the same as the ones in (33a-d), because they allow for verb to appear without a tense-marking prefix, just as in (33a,b).

in some inflections. Evidently, the past tense form marked for object focus involve the short grade.

- (35) a. **bǔul á-càm-à kwānⁱ** Bol PAST-eat-FOC porridge
 'Bol ate specifically porridge.'
 b. **bǔul á-mâl-à bjélⁱⁱ** Bol PAST-roast-FOC sorghum
 'Bol roasted specifically sorghum.'

ⁱ <<place here sound ex35a.wav>>

ⁱⁱ <<place here sound ex35b.wav>>

The construction illustrated in (34b) and (35a,b) is pragmatically marked, in the sense that the object is emphasized. In addition, object focus affects the alignment of core arguments. In pragmatically unmarked clauses involving transitive verbs, the object of transitive verbs and the Subject of intransitive verbs are not morphologically marked, whereas the Subject(Agent) of transitive verbs is introduced by the ergative marker (cf. Section 2). In the object-focus construction, however, the Subject(Agent) does not carry the ergative marker, on a par with the Subject of intransitives, and Subject(Agent) and Subject appear in the same position, i.e., before the verb. This means that the alignment of core arguments in the object-focus construction can be characterised as nominative-accusative, as opposed to the ergative alignment of the pragmatically unmarked constructions.

Table 16 shows the inflections for object focus in each of the four tenses. The stem is in the short grade in all tenses other than the perfective. As for the tone on the stem syllable, in past, perfective and future the specification reveals the lexical tone class: the Low verbs have a Low, the Low Fall verbs a Low Fall, and the High Fall verbs the High Fall. In the imperfective, the High Fall appear as a replacement toneme.

Table 16. The paradigms for object focus, for each of the seven verb classes in each of the four levels of tense/aspect found in independent clauses. The classes are represented by {ɲɔl} 'cut', {lɛŋ} 'drum', {cam} 'eat', {mal} 'roast', {lɛɛŋ} 'throw', {maat} 'drink', {mɔɔt} 'greet'.

Object focus	PAST	PERF	IMPF	FUT
Fixed Short / Low	á-ɲɔl-à	ɲɔl-à	ɲɔl-à	ú-ɲɔl-à
Fixed Short / Low Fall	á-lɛŋ-à	lɛŋ-à	lɛŋ-à	ú-lɛŋ-à
Short w. Grade / Low	á-càm-à	càaam-à	cám-à	ú-càm-à
Short w. Grade / Low Fall	á-mâl-à	mâmal-à	mâl-à	ú-mâl-à
Long / Low	á-lɛɛŋ-à	lɛɛɛŋ-à	lɛɛŋ-à	ú-lɛɛŋ-à
Long / Low Fall	á-mâat-à	mâaat-à	mâat-à	ú-mâat-à
Long / High Fall	á-mɔɔt-à	mɔɔat-à	mɔɔt-à	ú-mɔɔt-à

What determines the use of object-marking is not yet clear, and figuring this out will require a more heavily corpus-driven approach. While we have glossed it as focus, i.e., under the heading of information structure, syntax also plays a crucial role. Related to this are constructions involving small-clause objects, as in (36). Here we find again the Subject(Agent) of the main-clause verb in preverbal position, and the verb itself has the

suffix /-á/. Like the Low-toned suffix /-à/, /-á/ licenses the absence of a tense-aspect marking on the verb and SVO word order.

- (36) **bǔul dwàatf-á cà-m-ì kwānⁱ**
 Bol want-FOC eat-INF:SG porridge:SG
 ‘Bol wants to eat porridge.’

ⁱ <<place here sound ex36.wav>>

In the remainder of this section, we consider the relevance of this marked-focus construction to the diachronic development of morphosyntax in West Nilotic. Andersen (1988) discusses very similar phenomena in his descriptive analysis of the morphosyntax of verbs in the closely-related language Pāri. Like Shilluk, Pāri is an ergative language, with case-marking on the post-verbal Subject(Agent). This is illustrated in (37a), from Andersen 1990). The Object appears before the verb, just the Subject of intransitives does. Also as in Shilluk, object focus involves an inversion of word order from Object-Verb-Subject(Agent) to Agent(Subject)-Verb-Object, and the addition of the suffix /-à/ on the verb. This is illustrated in (37b), also from Andersen (1990). Crucially, in Pāri as well there is nominative-accusative alignment in the pragmatically-marked construction, as opposed to the ergative alignment of the pragmatically unmarked constructions

- (37) a. **pònd'-ò á-nèen dǎag-è** b. **dǎag-ò á-nèen-à pònd'-ò**
 boy AGR-see woman-ERG woman AGR-see-FOC boy
 ‘The woman has seen the boy.’ ‘The woman saw the boy.’

For Pāri, Andersen (1988) hypothesizes that the pragmatically marked construction with S(A)VO order and nominative-accusative alignment reflects the alignment at an earlier stage of language development. This hypothesis also fits with the Shilluk data. In particular, the fact that the class-specific specification for tone shows up when constituent order is S(A)VO supports the hypothesis that this order was once unmarked.

Dinka, another West Nilotic language presents evidence corroborating this hypothesis. It has S(A)VO as a basic word order, as in (38a), and OVS(A) as a pragmatically-marked construction, as in (38b), the latter with case-marking on the Subject(Agent).²⁰ This is how ergativity in Pāri and Shilluk arguably developed. The greater length of the stem vowel in (38b) than in (38a) can be attributed to compensatory lengthening triggered by a lost suffix, a diachronic morphophonological process that is pervasive in Dinka (Andersen 1990). In Pāri, this suffix is still there, as seen in (37b). In Shilluk it is not, but it has left a trace in the replacive tone on the stem, as seen in (34a). The phenomena in Dinka on the one hand and Pāri and Shilluk on the other differ in that the marked construction – with /-a/ in Pāri and Shilluk, and with compensatory lengthening in Dinka – involves a post-verbal object in Pāri and Shilluk, and a post-verbal subject in Dinka. The common characteristic is that a deviation from the standard word order is morphologically marked on the verb.

²⁰ The example in (38) is taken from the Bor dialect of Dinka.

(38) a. **bòol ă-tĩŋ mliirⁱ**

Bol AGR-see giraffe
'Bol sees the giraffe.'

b. **acóol ă-tĩŋ mliirⁱⁱ**

Achol AGR-see:NTS giraffe:OBL
'The giraffe sees Achol.'

ⁱ <<place here sound ex38a.wav>>

ⁱⁱ <<place here sound ex38b.wav>>

In Dinka, Pāri and Shilluk alike, then, the post-verbal Subject(Agent) is marked for case. The languages diverge as to whether this configuration is pragmatically marked, as is the case in Dinka, or not, as is the case in Pāri and Shilluk.

8. Conclusion

8.1 Summary

Shilluk transitive verb roots present a rich system of morphological exponence. There is morphological marking of tense-aspect-modality (TAM), spatial deixis, valency-changing operations, subject marking, and focus marking. In relation to this rich array of morphological functions that are encoded on the verb, the set of segmental affixes turns out to be small. If we set aside the subject markers that are derived from pronouns, there are prefixes with segmental structure /a-, u-/, and suffixes with structure /-i, -a, -ɔ/. Importantly, these affixes do not mark inflections by themselves; instead, they combine with stem-internal markers. In addition, there are numerous inflections that are purely stem-internal.

Two characteristics of stem-internal morphology in Shilluk are worth highlighting. First, the potential to combine inflections is to some extent limited by the phonological template of the stem syllable. For example, iterative and applicative are logically independent functions. If the morphology were concatenative, we could expect both to be morphologically marked on the verb. In Shilluk this is not possible, presumably because the patterns of stem-internal marking that are involved are incompatible: the inflectional marking of applicative involves vowel lengthening, while that of iterative involves vowel shortening. This means that Shilluk is restricted in its morphology in a way that languages that make greater use of concatenative morphology are not (e.g. Ngunga 2000 on Ciyao, Devos 2008 on Makwe).

Second, syncretism is widespread. It occurs whenever the lexical specification of a root coincides with the stem-internal marking template of an inflection. This characteristic is inherent to stem-internal morphology – see e.g. Pike (1948) for similar phenomena in Mazatec. Note, for example, how in Shilluk the distinction between centrifugal and centripetal spatial deixis cannot be marked on **á-kéel** 'PAST-spear:FUG/PET' because the [+ATR] root vowel precludes the marking of the difference between these inflections. Similarly, the contrast between durative and single-action antipassive cannot be marked on **ŋút-ə**, 'PERF-cut:ATP.DUR/ATP.SGL' because as a Fixed Short verb {ŋɔɭ} does not allow for the morphological expression of the difference between these inflections through vowel length.

It is worthwhile to note that the distinction between affixal and stem-internal exponence in Shilluk does not align with the traditional distinction between derivational and inflectional morphology. For example, in relation to the derivational phenomenon of antipassive formation, the past-tense durative antipassive has a purely stem-internal pattern of exponence (e.g. **á-cɿɿɿɿm** ‘PAST-eat:ATP.DUR’), whereas the past-tense single-action involves suffixal marking (e.g. **á-cɿm-ì** ‘PAST-eat:ATP.SGL’). And in relation to the inflectional phenomenon of subject-marking formation, the past-tense 2nd singular has a purely stem-internal pattern of exponence (e.g. **á-càaam** ‘PAST-eat:2S’), whereas the past-tense 1st singular additionally involves a suffix (e.g. **á-càaam-á** ‘PAST-eat:1S’).

Seven classes of transitive verbs can be distinguished based on how the above-mentioned inflections are expressed in the morphology.²¹ The difference between the Low and Low Fall verb classes is visible in several past-tense inflections, including past tense 2nd singular and past tense applicative. Surprisingly, this difference in tonal specification between verb classes is not visible in the basic past tense form, where we find replacement specification for tone, i.e., the High Fall across all verb classes. In Section 7, we hypothesized that this results from the reinterpretation of a pragmatically and morphologically marked construction as the unmarked construction. In the following section we will explain this further with reference to comparable phenomena in closely-related languages.

8.2 Diachronic development

It is worthwhile to consider the Shilluk transitive verbs in the context of the diachronic development of morphology in West Nilotic languages. Several West Nilotic languages have lost suffixal morphology and developed rich systems of stem-internal morphology (Andersen 1990). Andersen finds that Dinka has progressed the furthest along this path of development, in particular through the development of three-level vowel length.²² Some pronominal affixes aside, Dinka has little suffixal morphology left. Andersen argues that Dinka developed three-level vowel length through compensatory lengthening, as the quantity of lost suffixes shifted to the stem syllable. The original two-level vowel length contrast is conserved in languages like Pàri, and also in Anywa. Both of these languages have suffixes marking inflections which are conveyed through stem-internal changes in Dinka. Our findings suggest that, on this path of diachronic development, Shilluk is at a point intermediate between Pàri and Anywa on the one hand and Dinka on the other. It has lost some of the suffixal markers (e.g. the one marking a 2nd singular subject), and retained others (e.g. those marking 1st and 3rd singular subjects). And different from Pàri and Anywa but like Dinka, Shilluk has developed a three-level vowel length distinction, and the functional load of marking the inflections has shifted towards stem-internal markers (cf. Remijsen, Miller-Naudé &

²¹ In this context, the basic past tense, the past tense 2nd singular and the past centrifugal can be interpreted as principal parts (Stump & Finkel 2007), on the basis of which the remainder of the paradigm is predictable.

²² Three-level vowel length has also been reported for the two West Nilotic that are most closely related with Dinka, namely Thok Reel (Reid 2010) and Nuer (Crazzolara 1933).

Gilley 2015). An example of this is the /-ɔ/ suffix, which is found among others in the perfective and in the imperfective. This suffix is unstable at the current stage of the language. It is invariably reduced, and often the only evidence of its presence is a breathy release. However, its presence is correlated with increased vowel length. Here we are witnessing the process of compensatory lengthening and concomitant loss of suffixal inflection as it is unfolding.

8.3 Future directions

There are many outstanding questions in the descriptive analysis of Shilluk, most of all in the area of syntax. One important issue is the marker /-a/, the syntactic effect and function of which remains to be fully understood. Complex predicates (involving serialisation and auxiliaries), and subordinate/dependent clauses also remain to be investigated in depth. These topics relate to the study of constituent order. While OVS order is found in pragmatically unmarked transitive clauses, SVO order is very common in Shilluk, in particular in constructions that are more complex or are more integrated with a preceding discourse context. Progress on these topics will require greater use of corpus data. We hope that the morphological analysis presented here will foster these and other investigations into the Shilluk language.

Acknowledgements

We thank Otto Gwado Ayoker, our primary language consultant. Throughout this investigation, he has provided not only elicitations and recordings, but also various important insights. We also thank the other consultants who were involved during the initial period, in particular Twong Yolong Kur, Onyoti Adigo Nyikwec, and Peter Mojwok Yor. And we thank SIL Sudan and SIL South Sudan, for facilitating data collection in Khartoum, Juba, and the Shilluk land. The first author gratefully acknowledges the Leverhulme Trust, which supported the completion of this project through the research grant “A descriptive analysis of the Shilluk language”. Earlier on, his involvement was supported by the Arts and Humanities Research Council, through the research grant “Stress in Nilotic - a typological challenge” The second author’s involvement was supported in part by the National Research Foundation of South Africa (UID 95926). She acknowledges that opinions, findings and conclusions or recommendations expressed in any publication generated by the NRF supported research are those of the author, and that the NRF accepts no liability whatsoever in this regard.

Abbreviations

APPL	Applicative	FUT	Future	PET	Centripetal
ATP.DUR	Antipassive, durative	HABIT	Habitual	PAST	Past
ATP.SGL	Antipassive, single-action	IN	Inclusive	PERF	Perfective
BNF	Benefactive	IMPF	Imperfective	PREP	Preposition
DEM	Demonstrative	INF	Infinitive	PREV	
DUR	Durative	ITER	Iterative		

ERG	Ergative	MODIF	Modifier		Demonstrative (previous mention)
EX	Exclusive	NOM	Nominalisation	SG	Singular
FOC	Focus	PL	Plural	SPT	Spatial
FUG	Centrifugal				

References

- Andersen, Torben (1988). Ergativity in Pāri, a Nilotic OVS language. *Lingua* 75, 289-324.
- Andersen, Torben (1990). Vowel length in Western Nilotic languages. *Acta Linguistica Hafniensia* 22, 5-26.
- Andersen, Torben (1992-1994). Morphological stratification in Dinka: On the alternations of voice quality, vowel length and tone in the morphology of transitive verbal roots in a monosyllabic language. *Studies in African Linguistics* 23(1), 1-63.
- Andersen, Torben (1993). Vowel quality alternation in Dinka verb inflection. *Phonology* 10, 1-42.
- Baerman, Matthew (2011). Defectiveness and homophony avoidance. *Journal of Linguistics* 47, 1-29.
- Crazzolara, J.P. (1933). *Outlines of a Nuer Grammar*. Modling bei Wien: Verlag der Internationalen Zeitschrift 'Anthropos'.
- Devos, Maud. 2008 *A Grammar of Makwe*. München: LINCOM Europa.
- Dimmendaal, G.J. (2003). Locatives as core constituents. In E. Shay & U. Seibert (eds.) *Motion, Direction and Location in Languages*. Amsterdam: John Benjamins, 91-109.
- Dixon, R. M. W. (1994). *Ergativity*. Cambridge: Cambridge University Press.
- Fillmore, Charles J. (1977). The case for case reopened. In Peter Cole & Jerold M. Sadock (eds.) *Syntax and semantics – volume 8: Grammatical relations*. Academic Press, 59-81.
- Gilley, Leoma G. (1992). *An autosegmental approach to Shilluk phonology*. Dallas: Summer Institute of Linguistics.
- Gilley, Leoma G. (2003) The feature of stress in Nilotic. In Rose-Juliet Anyanwu (ed.): *Stress and Tone – the African Experience*. *Frankfurter Afrikanistische Blätter* 15, 99-120.
- Haspelmath, Martin and Thomas Müller-Bardey (2004) Valency change. In Geert Booij, Christian Lehmann and Joachim Mugdan (eds.) *Morphology: A Handbook on Inflection and Word Formation*. Vol. 2. (Handbücher zur Sprach- und Kommunikationswissenschaft) Berlin: Mouton de Gruyter, 1130-1145.
- Mietzner, Angelika (2007). Location, motion, and movement in Keyo. *Annual Publication in African Linguistics* 5, 145-163.

- Miller, Cynthia L. and Leoma G. Gilley (2001). Evidence for ergativity in Shilluk. *Journal of African Languages and Linguistics* 22: 33-68.
- Miller, Cynthia L. and Leoma G. Gilley (2007). Evidentiality and mirativity in Shilluk. In Mechthild Reh & Doris L. Payne (eds.). *Advances in Nilo-Saharan linguistics: Proceedings of the 8th International Nilo-Saharan Linguistics Colloquium, University of Hamburg, August 22–25, 2001*. 191–206. Cologne: Rüdiger Köppe Verlag.
- Nichols, Johanna, David A. Petersen, & Jonathan Barnes (2004). Transitivity and detransitivizing languages. *Linguistic Typology* 8: 149-211.
- Ngunga, Armindo (2000). *Phonology and morphology of the Ciyao verb*. Stanford: Center for the Study of Language and Information Publications.
- Pike, Kenneth L. (1948). *Tone Languages, A Technique for Determining the Number and Type of Pitch Contrasts in a Language, with Studies in Phonemic Substitution and Fusion*. Ann Arbor: University of Michigan Press.
- Reh, Mechthild (1996). *Anywa Language – Description and Internal Reconstructions*. Nilo-Saharan 11. Cologne: Rüdiger Köppe Verlag.
- Reid, Tatiana (2009). *Suprasegmentals in Shilluk nominal morphophonology*. University of Edinburgh undergraduate Honours dissertation.
- Reid, Tatiana (2010) *Aspects of Phonetics, Phonology and Morphophonology of Thok Reel*. University of Edinburgh MSc thesis.
- Remijsen, Bert, Otto G. Ayoker, and Timothy Mills (2011). Shilluk. *Journal of the International Phonetic Association* 41(1), 111-125.
- Remijsen, Bert & Otto G. Ayoker (2014). Contrastive tonal alignment in falling contours in Shilluk. *Phonology* 31(3), 435-462.
- Remijsen, Bert, Cynthia L. Miller-Naudé & Leoma G. Gilley (2015). Stem-internal and affixal morphology in Shilluk. To appear in Matthew Baerman (ed.) *The Oxford Handbook of Inflection*. Oxford University Press, 577-596.
- Stump, Gregory and Rafael Finkel (2007). Principal parts and morphological typology. *Morphology* 17, 39-75.
- Tucker, Archibald N. (1955). The verb in Shilluk. *Mitteilungen des Instituts für Orientforschung* 3: 421-462.
- Zwarts, Joost (2007). Number in Endo-Marakwet. In Mechthild Reh and Doris L. Payne (eds.). *Advances in Nilo-Saharan linguistics: Proceedings of the 8th International Nilo-Saharan Linguistics Colloquium, University of Hamburg, August 22–25, 2001*. Cologne: Rüdiger Köppe Verlag, 191–206.

Appendix

Table. A list of transitive verb roots belonging to each of the seven classes of transitive verbs that are outlined in Section 2.

Fixed Short / Low	Fixed Short / Low Fall	Short with Grade / Low	Short with Grade / Low Fall	Long / High Fall	Long / Low	Long / Low Fall
<p>ηɔl ‘cut’, buɣ ‘scrape’, ɲɔt ‘suck’, ηet ‘swim’, lɛm ‘save for’, lut ‘hit with fist’, ɟut ‘bother’, bul ‘roast’, bɔɣ ‘slide on limb’, gur ‘drive down’, ηic ‘recognise’, kum ‘cover’, kɔc ‘carve out’/‘separate by owner’, kɔɲ ‘help’ / ‘pour’, kɔl ‘offend’, puɣ ‘loosen (vert.)’, tum ‘fish’, nem ‘break off’, tik ‘repair’ lɔɲ ‘change (clothes)’, twic ‘tighten’</p>	<p>lɛɲ ‘drum’, buk ‘shake up’, kɔl ‘take out’, kɔk ‘hoe’, ηer ‘make incisions’, rik ‘fillup’, lot ‘heat (dried food)’, lol ‘go around’, tim ‘weigh’, den ‘pack together’, mɔj ‘crush’, ken ‘soothe’, mɔt ‘break to pieces’, ηek ‘fold and cut’, ηen ‘make flat/ smooth’</p>	<p>cam ‘eat’, nɔk ‘kill’, ɟak ‘pull’, kɔl ‘take away’, mak ‘catch’, par ‘remember’, kak ‘split’, ɟaj ‘apply tribal marks’; baɲ ‘refuse’, lam ‘lift curse’, kac ‘bite’, cwak ‘defend’, jwetɣ ‘defile’, tɟek ‘defile’, tɟek ‘finish’,</p>	<p>mɔl ‘heatup’, cɔp ‘kick’, ɟap ‘stir’, bak ‘boil’, ɟak ‘wash (using foam)’, kan ‘hide’, ,ɲam ‘chew’, ɲom ‘mix’, ɲaj ‘bite lightly’, tap ‘tread down’, djel ‘repel’, tɟek ‘attack from all ’ / ‘hammer sharp’, gwet ‘write’</p>	<p>mɔɔɣ ‘greet’, buuɣ ‘deceive’, lɪm ‘probe depth’, kiil ‘ration’, ɣuuk ‘put beads on’, buul ‘submerge’, duut ‘misinform’, puɣ ‘grow’, luɲ ‘take turns’, caam ‘feed’, ηic ‘train’, kaak ‘give to drink’, paak ‘address with title’, tuum ‘gossip’, laal ‘redo’, ɟaj ‘support walking’, jeej ‘agree on’, muuc ‘give’, cuuɣ ‘polish’, gwaat ‘insult’, wɪl ‘change’, cwaak ‘push firewood’,</p>	<p>keel ‘spear’, lɛɲ ‘throw’, ɣook ‘lift’, bɔɔɣ ‘isolate’, gɛɛr ‘build’, ηɔɔj ‘imitate’, kɔɔk ‘remunerate’/ ‘plow’, tɛɛk ‘host lavishly’, gɔɔc ‘hit’, gɛɛr ‘build’, tɔɔk ‘scoop out’, ɣooɣ ‘take’, deet ‘block’</p>	<p>maat ‘drink’, kɔɔl ‘herd away’ ɟaak ‘rule’, kɪl ‘tear off’, kɛɛl ‘separate’, kuul ‘surround’, luɲ ‘pluck’, luut ‘carve into’, buuk ‘cover in ashes’, lɪɣ ‘see(past)’, guur ‘grind’, juut ‘find’, kuut ‘encircle’, puuɣ ‘harvest’, mɪn ‘pierce’, ɲaap ‘hang’, pɛɛɣ ‘spread’, puuc ‘wipe’, ɲaal ‘slaughter’, mɛɛɲ ‘illuminate’, cuul ‘pay for’, cɔɔɲ ‘dance’, kuuɣ ‘blow’, ɣaal ‘cook’, kwaac ‘beg’, tɛɛɲ ‘clean’</p>